

Sales Executives

London based
One of the leading computer manufacturers is continuing to expand its sales force and is therefore looking for several sales executives to join a highly motivated and successful team.
Applicants must have a proven sales record in the sales of minis or medium range computers, or have extensive experience in the services industry.
These are excellent opportunities for above average earnings in a professional environment.

Contact: Jim Baker

COBOL Programmers

Berkshire based
Our client, a leading software house, has immediate vacancies for programmers to work on the development of a variety of systems.
Candidates must have two years experience of COBOL in a commercial environment, preferably on a mainframe such as IBM, ICL, Honeywell, etc. Knowledge of real-time, communications or database applications would be an advantage.
The Company have an extensive growth plan and are willing to provide a training programme on new machines.
Attractive salaries and benefits with opportunities to travel.

Contact: Jim Baker

**Technical Advisers
Projects Managers**

Herts
Excellent opportunities have arisen with a small business systems manufacturer for experienced software/commercial support persons to provide liaison and technical aid to a wide ranging customer base. Candidates will have a sound and varied commercial programming and systems analysis background, coupled with proven management and post sales experience. Since the key function is client liaison appointees will be personable individuals with the ability to communicate effectively with technical managers.
A substantial starting salary will be paid to attract high calibre people.

Contact: Margaret Stevens

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES
International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

**Manager
Commercial Applications Group**

London
A well established computer bureau has a requirement for a d.p. professional to head up the commercial applications team. The successful candidate will have a broad background in systems analysis, programming and project control, together with experience of man-management. The Company offer an excellent computing service based on two large systems supplying integrated timesharing and remote batch services throughout the U.K. COBOL/FORTRAN are the main languages used, while the work content is mostly to analyse customer requirements and to identify solutions.
Excellent salary and fringe benefits include a bonus and a profit sharing scheme.

Contact: Margaret Stevens

Australia

Offers a new start and good income for computer professionals either planning to emigrate or to work there for a year or two. It's worth considering and we can help you make the decision.
In conjunction with our Australian associates we provide in the early stages an advisory service:

- we look at your past experience;
- inform you objectively of your career prospects;
- salary expectations;
- the type of position you could fit into.

In addition we advise on the following:

- aspects of getting there;
- shipping of personal effects;
- transference of funds;
- information on standards of living (costs, etc.)

We will assist on arrival, settling in and getting initial accommodation.
We don't necessarily line you up with a job before you get there—we offer a choice of prospects from which you can choose. It's a new, unique service and if you are seriously contemplating Australia give us a ring and have a chat about it.

Contact: Mike Creamer

**FORM DESIGN
COMPUTER
STATIONERY
& BUSINESS FORMS**

for HIGH QUALITY
COMPETITIVE PRICES
QUICK DELIVERY
plus FIRST CLASS SERVICE
formdesign
1111 STREET DUDLEY WEST MIDDLESEX U.K.
TEL: 0204 57461 TELEX 330407

NUMBER 78

COMPUTER WEEKLY International

THURSDAY, NOVEMBER 10, 1977

**ACCOUNTS
PACKAGES**
NSC
MARKETED IN GERMANY - CANADA
USA - UK - IRE
15 CROSS STREET
MANCHESTER M2 1WF
ENGLAND
TEL: 061-832 8987

Nords in bid for US simulators

NORWEGIAN Nord-50 and Nord-10 minicomputers are the basis of three of the four bids being entered for a US Air Force simulator contract.

The requirement is for 18 simulators for the new General Dynamics F-10 fighter, which will be used to train pilots to fly 1,000 of the USAF's total complement of 3,000 F16s. Simulators are likely to be required for the other 2,000 machines, leaving the winner of the current contract well placed for further business.

**DG European
sales chief**

Ray Fortune

ALL Data General's area managers in Europe now report to Ray Fortune, who has been appointed to the newly-created post of sales director, Europe.

Until now Fortune has been based in London as area manager for North West Europe. His new job takes him to Data General's European headquarters in Paris.

Ray Piggot, formerly UK national sales manager, has succeeded Fortune as area manager North West Europe. In this position he has responsibility for Data General's activities in the UK, Belgium and the Netherlands.

TP monitor launch

TRANSACTION processing has moved on to another line of small machines, with the announcement by Interdata of the Itrac TP monitor for its 32-bit minicomputers. The product was developed by Interdata's European software group based in the UK.

Brazilian clamp-down on foreign minis

TIGHT restrictions by the Brazilian government on the minicomputer and small systems business are planned to take their final form before the end of the year.

Central to the scheme is the effective exclusion of all but two overseas companies, and the government's own venture, from import or local manufacture of machines.

**Third world
urged to
limit imports**

TO save on spare parts and deploy their computer resources more effectively, developing countries should limit the variety of computers they import.

This view was expressed by Norman Revell, a lecturer at the City University Business School, London, who visited the International Conference on Computer Applications, held in Bangkok.

Speaking at a meeting of the BCS Specialist Group for Developing Countries, Revell reported that the conference delegates differed sharply on whether developing countries could learn from the experience of advanced countries and skip the early steps of computer development, or whether they needed to start from scratch and learn from their mistakes.

Small systems companies, from the giant multinationals to minor firms, are currently showing their wares to the Brazilians, in an effort to gain one of the two hotly contested contracts.

According to a South American trade expert, companies like DEC, Data General and IBM — with System 32 and 34 and possibly Series 1 — are less likely to

be awarded tomorrow (Friday). The high regard in which the Nord minis are held among the scientific community is emphasised by the fact that CERN, the Centre for European Research into Nucleonics in Geneva, now has 70 of them.

Two networks are being established in Scandinavia using Nord-10 minis. Scanet — linking research establishments in Stockholm, Helsinki, Copenhagen, Gothenburg, and Oslo — is a store-and-forward message switching system for information exchange, and Uninet is a planned pan-Scandinavian packet-switched network which will enable universities to share their computing power.

Moral dilemma over Interpol's moves for own system

ACCORDING to reliable sources, Interpol, the international police organisation, is working towards the establishment of a computer centre at its St Cloud headquarters, outside Paris.

Even though Interpol does not now have its own computers, it does have access to the computerised information systems of the US government.

Interpol is believed to have similar access to the automated government records of Germany, France, the UK, the Netherlands and those of many other nations.

In addition, according to GAO, Interpol can obtain such items as local police information and even copies of US citizens' passport photographs.

While the GAO report did not specifically accuse Interpol of abusing its privileges, it did state that in its limited study it determined that "requests (of information) often did not furnish adequate documentation

to support their requests." The report then detailed several criticisms of Interpol.

According to GAO, while Interpol could not be specifically accused of acting in ways that were different from its claims, "there is no practical way to assure (its) compliance" with regulations.

When an NCLE investigator, Vaughan Young, travelled throughout Europe recently, he was falsely accused of counterfeiting his copy of the GAO report — and of impersonating a US government official.

Young claims to have accurately identified himself, and he even appeared at Interpol offices in an attempt to clear up the matter.

The GAO report he was accused of fabricating is readily available to anyone who is curious.

Interpol sent his name and its accusations to the various Interpol bureaux around the world, and a divisive story about Young was planted in the West German Press.

V77s replace ICL systems in Sydney

THE former Varian Data Machines, now Univac Mini Computer Operators, has given ICL a rough ride in Australia. V77 minicomputers have been ordered to replace or supplement small ICL systems at four companies, two of which are using the highly successful 2803.

A 1902T at Berliet Haskia in Sydney will be replaced by a V77-600, and Psal Hamlyn, also in Sydney, is putting in a V77-600 alongside its 1901A.

In Melbourne, perhaps the biggest disappointment for ICL

is that a reservation system, for Flag Hotels, run as a pilot on a 2803, is to be transferred to V77 minis at four sites. But Flag still runs two 2803s.

Also in Melbourne, a health insurance fund is to replace its 2803 with a V77.

Overall, ICL's position in Australia appears to have been weakening, with few orders yet placed for large 2800s, and the Queensland government has decided to replace its 1900 series machine with a Univac 1100/82 (CWI, May 5).

Making their mark in Munich

One of 18 UK companies that appeared together at Systems 77 in Munich was the Data Recording Instrument Co, which exhibited some of its peripheral equipment range on the stand pictured here.

The joint UK venture was backed by the British Overseas Trade Board and sponsored by the Business Equipment Trade Association.

One of the other firms that took part, Compex, was making its first major public presentation at any exhibition. The main presentation on the Compex stand was of Gelle, Compex's design system for the automatic

layout of printed circuit boards and integrated circuits.

Another big crowd puller among the UK exhibits was a demonstration on the GEC stand of Bildschirmtext, the German equivalent of the UK Post Office's teletext service, Viewdata. The German Post Office runs Bildschirmtext on a GEC 4080.

About 22,000 visitors attended Systems 77 over the five days of the show, 50% more than went to Systems 76. A total of 470 companies took stands, including almost every major US and European computer equipment manufacturer.

EXPAND YOUR PDP11 WITH B.M.L.

**INTERFACES
SUB-SYSTEMS
FAST DELIVERIES
COMPETITIVE PRICES**

BML

BILLING MACHINES LTD
CLIFTONVILLE ROAD
NORTHAMPTON
ENGLAND NN1 5BU
TEL: (0604) 219115
TELEX 91504

Assembler Programmers To £6,000 Watford Area

These are rather special opportunities for rather special people — people who wish to take an immediate step forward in salary and responsibility, people who seek the flexibility to shape and progress their own careers with a successful and rapidly expanding company.

- The posts offer:
- Fast (we mean fast) promotion on merit.
 - Technically demanding work.
 - The opportunity to meet clients in the U.K. and Europe.
 - A pleasant, unconventional environment.
 - An interesting and valuable benefits package.

Experience? — Well, system programming on a Nova or similar machine operating under RDOs would certainly be a big plus.

Interested? Then please phone Mike Gernat on '01-229 9239 (office hours) or 076384-618 (evenings — if more convenient).
Technomark, King House, 5/11 Westbourne Grove, London, W2 4UA

Technomark
Engineering and Technical Recruitment

How IBM deals with terrorist threats

THE recent battle between IBM and Forro Precision, Inc. in a United States federal court evokes memories of some embarrassing revelations faced by the computer giant nearly three years ago. At that time IBM was discovered to be training its security forces to infiltrate outside organisations which, in IBM's opinion, posed a threat to the corporation.

On September 16 of this year, Forro Precision, a Woodland Hills, California, manufacturer of machinery used to build disc drives, was awarded \$2.7 million when a jury determined that IBM had intentionally interfered with Forro's business practices in violation of California law. The charges stemmed from IBM's investigation of Forro's affairs, carried out with the aid of a former agent of the US Federal Bureau of Investigation.

Forro's victory, according to attorney Joseph M. Alito Jr, was in part due to IBM's use of improper tactics to obtain a warrant to search Forro's premises. IBM had contended that its actions were justified because its secrets were being used by competitive disc drive manufacturers.

Sworn testimony describing the methods and naming some

of the persons employed by IBM during its investigation are included in the record of the suits between IBM and Telex. The jury in the Forro v IBM suit also found, in accordance with IBM's claims, that Forro used IBM's trade secrets in the course of making machinery for its customers. As a consequence, Forro was ordered to pay IBM nearly \$281,000 in damages. Forro's attorney contends that the specifications it received from its customers had come from IBM.

Two other charges made by Forro, that IBM violated antitrust statutes and that Forro is entitled to punitive damages in addition to the direct damages it was awarded, resulted in no verdict. The jury, which must reach a unanimous verdict, was split in its opinions, and these charges will be re-examined in another trial.

The Forro suit is also related to another famous trial in the American computer business, that of a group called the San Jose Eleven. The persons involved in that case were accused by IBM of stealing trade secrets from IBM's San Jose, California, disc drive manufacturing facility. The eleven defendants were

eventually cleared because IBM's agents had used improper methods to obtain the information on which the theft charges were based.

IBM's security policies also caused a stir in the United States in late 1974, when it was revealed that IBM had been imitating some of its employees in methods of infiltrating outside organisations, alleged terrorist groups that IBM felt posed a potential threat.

The possible use of IBM's security personnel as secret agents to spy on outside organisations was studied in a

used. The course Cary called a "pilot" was given on November 4-15 at IBM's Management Development Centre in Glen Cove, New York, but the course had been previously tested on six IBM executives.

At the time Tamm wrote the letter, which he also made available to the press, he said that IACP was contemplating a suit against IBM because of the corporation's statements. That idea was dropped later, and IBM admitted that Tamm's contentions were factual.

The controversial materials, part of a larger program dealing with corporate security, appeared in the form of a booklet entitled *Security: A Management Style/A Course of Instruction in Corporate Protective Services*.

While warning IBM's people about the dangers of taking matters into their own hands, the material suggests that IBM contemplates the use of "counter-terror operatives, skillfully placed," and to understand the use of the "right kind of provocateur."

Bugging the FBI and CIA

PHONE PHREAK Captain Crunch whom I wrote about in my last letter from America (CW, September 18) is back in the news.

In an interview carried in *Professional Intelligence Reporter*, a monthly newsletter published in San Francisco, former phone phreak John (Captain Crunch) Draper claims to have tapped the telephones of both the Federal Bureau of Investigation and the Central Intelligence Agency. The technique used by Draper was applicable to many systems in the United States, although changes in telephone switching equipment made during the last two years have made his method obsolete.

During the first half of this decade telephone company maintenance personnel were able to test a line while it was in use by dialling a special access number with internal signalling tones. This procedure allowed telephone company personnel to monitor the quality — and the content — of ongoing calls. Draper claims to have figured out this access code, and he tried out his discovery by using the telephone switching system to interconnect his line with those of others, including the local offices of US government police agencies.

training course given to some IBM employees in November, 1974. At the time, IBM was apparently concerned about the danger posed by subversives in the United States and abroad. That concern may have been justified, because the very materials used in IBM's secret course were stolen and turned over to an anti-establishment newspaper in Berkeley, California, which published them only days after the course was completed.

At the time the documents were published, IBM's chairman, Frank Cary, said that he was "shocked" by the material used in the course. He also said that "it was only through a series of errors that (the material) was allowed to be used in even a single pilot class."

Dan Burnham, at that time IBM's top public relations man, at first said that the material was not prepared by IBM, but was developed by the International Association of Chiefs of Police (IACP) under contract. Both of those statements proved to be misleading, as a letter from Quinn Tamm, then president of IBM, to Cary revealed.

Tamm's letter denied IBM's placing responsibility for the materials entirely on IACP. The course materials, according to Tamm, were developed to meet IBM's specifications and were reviewed by the company's manufacturer before they were

LETTER FROM AMERICA

By Hesh Wiener

The course materials state that IBM should be wary of terrorism in such places as South Africa and Latin America as well as the United States, and that the corporation should develop an internal apparatus for dealing with threats and disturbances. Among the organisations singled out as posing a danger to IBM are the leftist National Councils of Labor Committees, the rightist American Nazi movement, and the Jewish Defense League.

IBM was told to develop trained operatives at each of its sites to deal with extremists, and to build a central corporate command to co-ordinate the local operations.

It is not known whether IBM changed its security procedures as a result of the ill-fated course, but the Forro, Telex and San Jose Eleven cases provide a glimpse into the company's methods of dealing with threats.

Electronic mail is growing

"ELECTRONIC mail is an adolescent sex — it talks about it but doesn't do it," says Howard Anderson, president of the leading US electronic mail service.

Anderson, president of Boston, Massachusetts, Group Consulting, Inc., says that electronic mail will soon be up.

"Electronic mail is the fastest growing part of the equipment and terminal market," he says. "The 1980s," he says, "will be the decade of the electronic mail."

In a recently released report on electronic mail, Bell Group notes that its dedicated user of electronic services has several options: building an electronic system, one obvious choice, or using a facsimile, but others are TWX-Telex and private typewriter message.

Newer technologies are available choices to the word processing and other-based message systems (CWMS).

Bell network threat to computer firms

ALTHOUGH primarily an instrument in the trial of strength between AT&T and IBM, the US-wide Bell Data Network planned by the telephone company is likely to have a serious impact on other computer companies.

This is the view of Gideon Gartner, analyst with New York stockbrokers Oppenheimer & Co. The Bell Data Network, as yet unannounced although it has been described to US share analysts, is intended to provide a data communications facility which provides a ready-made alternative for much of the arduous network implementation that users now have to undergo (CW, July 27).

It would take over the role of several communications hardware products at present supplied by mainframe manufacturers and communications equipment companies.

Among these are central processor front ends, multiplexers and concentrators, remote controllers and intelligent terminals.

Facilities provided would in-

clude network control, speed conversion, error control, terminal polling, message routing and rerouting and formatting. Some of these facilities are offered by the "value-added" carriers such as Telenet, which leases AT&T lines to provide a packet-switched service.

The sheer size of AT&T, one of the largest companies in the world, means that such a service would have a far more pervasive impact than Telenet. In addition it would include such facilities as a high-level language, allowing users to specify their communications requirements in near-English form.

While this would make it a tough competitor for IBM's System Network Architecture, its impact on other manufacturers which have already made a major investment in their own network architectures, would be equally serious.

Further along this line are Burroughs with BDL and Digital Equipment with DECnet. Univac's Distributed Communications Architecture and Honeywell's Distributed Sys-

tems Environment are less developed.

As for IBM, it is fully committed to the concept of distributed processing, despite its traditional emphasis on systems which centralise processing power. Series 1, System 32, System 34, 5100, 3790 and the forthcoming Orbit minicomputer are all potential distributed processing products, and telephone switching equipment such as the 3750 is also an element in IBM's grand strategy, as emphasised by an in-depth briefing at the company's La Grange, France laboratory in October.

AT&T is equally committed to winning a share of the burgeoning market for office automation and transmission services, including electronic mail and electronic funds transfer.

A subset of the proposed Bell Data Network called Transaction Network Service is already operating in some states in the US, providing a specialised funds transfer service to supermarkets.



Lecturer of Year award

CROWNING two years' success in establishing Logica in Australia, Don Jones has been given the Australian Computer Society's Lecturer of the Year award for 1977. As part of the award, he is currently on a tour of Australia, lecturing on microcomputers in data communications.

Jones, managing director of Australian subsidiary Logica Pty for the first two years of its existence, will return to Logica UK after his tour. He will be succeeded as Australian managing director by Tim Cooke, previously in charge of the Nordic subsidiary (CW, February 24).

'Leave small systems market to Redifon' says Heinz Nixdorf

FAILURE of the British computer industry to capitalise on the enormous market offered by the UK Big Four clearing banks worries Heinz Nixdorf, founder and head of Nixdorf Computers. "I think that ICL was wrong to let the Americans win the whole of that market without a fight," he says.

The foreign subsidiaries of Nixdorf are free to decide which products they will market from the Nixdorf catalogue, but Herr Nixdorf expresses himself uneasy at some of the decisions taken by the UK company.

Although Nixdorf Computer now owns Entrex, the licensor of the Redifon Seecheck key-to-disc system, which has been enhanced to include general data processing facilities as well as data entry, Herr Nixdorf sees no need for any conflict between the two companies in the UK.

"The royalties we get from Redifon are fair," he says. "In my personal view, Nixdorf UK should leave aside the B870 and concentrate on the B864 banking

terminal system. Two hundred people is about the right number for selling banking systems," says Herr Nixdorf.

"It is unwise to make competition against one's best friend, and we should leave the small systems market to Redifon."

Nixdorf UK counters by saying that the market for terminal orientated small business systems is so large that the £4 to £5 million business done annually by Nixdorf and the £10 million or so done by Redifon is sufficiently small that there is no danger of the two companies damaging each other by competition.

As for the banking system, a concentrated marketing effort is now being built up.

Fourth Century

THE fourth NCR computer to be ordered by the National Bank of Poland has now been installed. It is an NCR Century 251 system, and this latest order brings the value of NCR computers used by the bank to about \$4 million.

CII switching system to be built by CIT-Alcatel

THE large CS-40 switching computer developed by CII before the merger with Honeywell will be replaced by the CS-40 and the E-12 for large-scale telephone exchanges gives the French a big lead over the UK. The British equipment for the same market is designated System X and consists of Mark IIBL computers from Plessey and signalling equipment from STC.

Development contracts totalling about £20 million for the three companies were placed by the UK Post Office last summer (CW, August 11).

Several enhancements are being made to the CS-40, which

is based on the Iris 80. The 1K-bit memory chips from Intel will be replaced with 4K chips, and the drum storage will be replaced with fixed-head discs.

The decision to go ahead with the CS-40 and the E-12 for large-scale telephone exchanges gives the French a big lead over the UK. The British equipment for the same market is designated System X and consists of Mark IIBL computers from Plessey and signalling equipment from STC.

Development contracts totalling about £20 million for the three companies were placed by the UK Post Office last summer (CW, August 11).

Dataterm speeds South African school exam results

A DATATERM 3 optical mark reading system from Data Recognition has been installed by the Transvaal educational authority in South Africa to process school examination papers.

There are about 20,000 papers of this type annually from pupils taking the standard and higher grades of the Senior Certificate examinations, and these provide about 380,000 hand-written and OMR codes which will now be loaded on to magnetic tape via the Dataterm 3.

The Transvaal provincial government's dual Burroughs 88700 computers process this information within eight hours. Another application of the OMR system will be to handle the annual 300,000 forms giving

matriculation examination marks for the 1,200 schools in the area, data sheets on the 24,000 teachers and lecturers employed by the administration, and hospital patient statistical sheets.

Data is captured at the rate of up to 60 A4-size documents a minute and this is encoded on to magnetic tape via Honeywell encoders.

The system replaces a series of Honeywell terminals connected to Honeywell 316 mini computers at provincial government headquarters which, together with the twin Burroughs machines, operated two data communication processors, 190 online terminals and nine remote job entry systems.

Privacy laws conference

A CONFERENCE on the restrictions being imposed by national privacy and security legislation on international data flow is to be staged by Online in Brussels early next year.

Laws enacted in Sweden and West Germany and legislation pending in France, Holland, Spain, Norway, Denmark and Japan are likely to impose new restrictions on the transmission of data abroad, bringing problems and extra costs for the user.

Christopher Dayton, EEC science and technology director; Frans Hondius, EEC directorate of legal affairs; Jan Freese, Swedish data protection board; Professor Peter Kirstein, London University; and Carl Rauterstaal, of Swiss

The conference will take place at the Europa Hotel, Brussels, on February 7-8 and is non-residential. It costs 17,500 Belgian francs (about £280) and further details can be had from Online, Cleveland Road, Uxbridge, UB8 3DD, Tel: (089) 88282.

31 Countries* worldwide use CMC British made key-to-disk equipment

Can there really still be people punching cards?

Punched cards have a long history. More than 50 years longer than computers, in fact! Needing an easy-to-come-by data entry medium in the 1940s EDP pioneers chose the punched card. But who wants to be a pioneer forever?

Whether you have two or one hundred-and-two terminals CMC KeyProcessing is the input medium for you. KeyProcessing - the complete data entry system. first in key-to-disk

CMC

Head Office and Manufacturing: Computer Machines Limited, 100 Wood Lane, Birmingham B15 7AA. Telephone 021 717 2100. Telex 63540.

COMPUTER WEEKLY International

Inquiries about Computer Weekly International may be sent to these advertisement representatives:

CANADA
Colin H. McCulloch, International Advertising Consultants, 915 Canton Tower, 2 Canton Street, Toronto Tel: (416) 364 2269. Chablos Incadcon, Toronto.

FRANCE
Daniel Soubeyran, Compagnie Francaise O'Editions, 40 Rue du Colosse, Paris 8e Tel: 010 331 225 7750.

HUNGARY
Mis M. Brody, Hungexpo Budapest VIX Varosliget Tel: 225 008.

ITALY
C. Epis, Eias-Kompass, SpA, Via Meraviglia 6, 20154 Milan Tel: 347 051.

JAPAN
Mi Tomoyuki Inatsuki, Tmdo Media-IBPA, R 518 Roppongi, Un House 4-3-11 Roppongi, Minato-KU, Tokyo 106, Japan.

USA
New York
Mr Jack N. Viera, Advergent, 205 East 42nd Street, New York, New York 10017 (212) 889-0700.

Mr Raymond V. Barnes, IPC Business Press, 205 East 42nd Street, New York, New York 10017 (212) 889-0700.

Computer Weekly International is sent free of charge to the following categories: Company directors, company secretaries, management services executives, civil servants responsible for computing, management/computer consultants, lecturers and teachers, data processing managers, systems analysts/O&M officers, programmers, operators, computer equipment, field engineers.

Chicago
Mr Jack Farley, The Farley Company, Suite 1548, 35 East Wacker Drive, Chicago, Illinois 60601 (312) 346-3074.

Cleveland
Mr Jack Menial, The Farley Company, Suite 805, Henry Building, Cleveland, Ohio 44115 (216) 621-1919.

Florida
Mr Ray Rickles, Ray Rickles & Company, P.O. Box 2008, Miami, Florida 33140 (305) 532-7301.

Atlanta
Mr Frederic A. Bauer, Ray Rickles & Company, 3116 Maple Drive N.E., Atlanta, Georgia 30305 (404) 237-7432.

Los Angeles
Mr William Marshall, Scott Marshall Sands & Latta, Inc, 1830 West 8th Street, Los Angeles, California 90057 (213) 382-6346.

San Francisco
Mr Richard Sands, Scott Marshall Sands & Latta, Inc, 85 Post Office, San Francisco, California 94104 (415) 421-7950.

Houston
Mike Loughlin, IPC Business Press Ltd, 14724F Perimeter, Houston, Texas 77079 Tel: (713) 493 6871 Telex: 421710.

Sponsored by 'Computer Weekly'

COMPEC EUROPE 78

MAY 9, 10 and 11, 1978

CENTRE INTERNATIONAL ROGIER, BRUSSELS

The third annual specialised exhibition devoted to computers and systems to be staged in Brussels

COMPEC EUROPE in 1977 drew 5,300 visitors from the cream of the computer world. They came from as far away as the USA, Russia, Japan, Finland, Italy, Hungary and Poland — as well as from the great industrial areas of Germany, Holland, Belgium, France and the United Kingdom.

COMPEC EUROPE is sponsored by leading United Kingdom publications: "Computer Weekly" and "Data Processing", and is organised by the Little Promotions. All arrangements, Business Press at Dorset House, Stamford Street, London SE1 2UL, England. Telephone: 01-261 4000. Telex: 26137 BLSBGG.

To:

Chite Timmla, Exhibition Manager, Compec Europe, Room E21, Dorset House, Stamford Street, London, SE1 2UL, England.

Name _____

Street and Number _____

Town _____

District and Postcode _____

Country _____

I wish to exhibit at COMPEC EUROPE 78 — please send me details.

I wish to visit COMPEC EUROPE 78 — please send me details.

Please send me _____ (number) type pre-registration tickets.

*Complete and return to: _____

MARKETVIEW

The Scandinavian market

HOW far can minicomputers take over the tasks of large mainframes? Can they control large databases effectively? Is the distributed processing ring network a practical alternative to the mainframe-based hierarchical network? Will the software work?

These questions have been the stuff of computer conference discussions for

some time. Many speakers have expressed scepticism about the distributed processing concept, but what distributed processing advocates are predicting for the 1980s is already happening in Scandinavia. There, two of the three leading Scandinavian manufacturers, Norsk Data, and Regnecentralen, have been installing distributed processing

networks for a number of years, and Norsk Data is even implementing Codasyl compatible distributed databases on networks of 16-bit word minis.

This is somewhat paradoxical, because 15 years ago the Scandinavians were Europe's leading practitioners of centralised DP. Not only were their government departments and large corporations

leading Europe in centralising on a single large mainframe, but even small to medium users were clubbing together to run a large mainframe on a co-operative basis.

The reason why small Scandinavian users centralised in the early 1960s was no philosophical belief in centralised management or processing, however. It

was strictly for economy reasons. It makes it all the more significant that the same economy-mindedness should be leading them away from mainframes to distributed networks. The Scandinavian manufacturers certainly have a something better and different to offer.

New lease of life for Datasab

THE computer division of the Swedish industrial group, Saab-Scania, is Datasab, the only Scandinavian DP equipment maker that has not yet entered the communications network market. The division has been having a tough time and in order to ensure its survival the Swedish government is pumping funds in and a new company has been formed which comes into official being on January 1. To be known as Svenska Data it will be owned 50-50 by the government and Saab-Scania.

The other component of the which specialises in air traffic control and hospital systems, and also makes the Alfa-kop display terminal. Heading the company is Stansab's managing director Gunner Wedell.

Saab-Scania also has a 51% share in the Saab-Univac marketing operation in all Scandinavian countries except Finland where it has only 26% because of a three-way split with that country's computer equipment company, Nokia.

Datasab has been longer than most manufacturers in the terminal end of distributed processing, since it was the first company to offer an intelligent minicomputer controlled banking terminal system as far back as 1970. That was the D5 series, now marketed not only throughout Europe, but even in the US.

In the general purpose business field, Datasab offered only the D12 office computer and D15 small business computer, whose proprietary languages and accounting packages, and lack of

communications facilities, made them more suitable for the small business.

In August, however, Datasab widened its options by announcing the D16/30. While designed partly as an upgrade for existing D15 users, the D16/30 offers also a number of features that will appeal to organisations with outlying locations.

It is programmable interactively in Cobol, so that large users can simply transfer to distributed D16/30 systems smaller Cobol source programs originally written for a central mainframe. It offers also a variety of terminal emulators, allowing it to exchange data online both with other D16/30 systems, and with IBM and Univac mainframes.

The D16/30 emulators cover the IBM 2780/3780 and Univac DCT 2000 or 9000 RJE, and also include an IBM 3270 emulator, that will allow D16/30 workstations to interrogate directly a host IBM 370 computer's disc files during local transaction processing.

This feature will also allow Datasab to upgrade users of the Stansab Alfa-kop 3270-compatible display clusters to D16/30 distributed processing systems.

Datasab has also anticipated the computer market of the 1980s by pioneering special purpose hardware/software packages for certain types of user: notably the D18 travel agency system that can print IATA air tickets and perform the IATA accounting routines as well.

MANUFACTURER	Datasec		Norsk Data			Regnecentralen		
MODEL	D15	D16/30	NORD-12	NORD-10/S	NORD-50	RC 3600	RC 6000	RC8000
MAIN MEMORY								
Minimum capacity (bytes)	8K	32K	8K	84K	128K	16K	16K	96K
Maximum capacity (bytes)	16K	128K	128K	512K	4M	64K	64K	128K
Cycle time (Nanoseconds)	960/1,200	550/1,200	1,000	450	300	1,200	1,200	900
DISC STORAGE (MAX)								
Maximum capacity (bytes)	40M	120M	80M	792M	792M	264M	264M	3,300M
TERMINALS								
Max number per system	16	32	16	64	94	16	4	84
SOFTWARE								
Operating system	OS/15	OS/16	Sintran III	Sintran III	Sintran III	—	Syalam 60	Syalam 60
Multi-programming of:								
—Transaction processing	Yes	Yes	Yes	Yes	No	Data entry	Yes	Yes
—Multi-access program development (time sharing)	No	No	Yes	Yes	No	No	No	Yes
—Background batch	No	Yes	Yes	Yes	No	RJE to host	Yes	Yes
Languages	Logic-3	Cobol Logic-3	Cobol RPG II Fortran IV Basic Coral 66 Pascal Simula Nord-PL	Cobol RPG II Fortran IV Basic Coral 66 Pascal Simula Nord-PL	Fortran IV	Mixell	Extended Basic	Extended Basic Fortran II Algol
Databases management system	No	No	Sibex Yes	Sibex Yes	Sibex Yes	No	No	CFS No
Communications node control	No	No	Nordnet	Nordnet	No	RCNET	No	No
RJE terminal emulation	No	IBM, Univac	IBM, CDC Honeywell Univac	IBM, CDC Honeywell Univac	No	IBM, ICL Honeywell Univac, Siemens	No	No
IBM 3270 terminal emulation	No	Yes	No	No	No	Yes	No	No

Table 1. The characteristics and capabilities of the various Scandinavian machines.

From bureaux to networks

WITHIN the last two years, the Danish manufacturer Regnecentralen has followed Norsk Data, both in attacking the front-end communications processing and distributed processing network markets, and in offering multi-mini configurations to perform mainframe tasks.

Unlike Norsk, RC has had a marketing network of agents and wholly owned subsidiaries throughout Europe for some time. But outside Scandinavia, this network has been selling mainly the RC 2000 high-speed paper tape reader to the OEM market, and in most countries also the RC 3600 intelligent offline data conversion systems and RJE terminals.

What is less well-known is that these products have been only the fall-out of RC's main activity, providing service bureau facilities. Its name, indeed, means The Computer Centre in Danish.

Regnecentralen was formed in 1960 with the Danish government's encouragement to provide bureau facilities to local authorities and small to medium size businesses, as an alternative to IBM 1401 and similar small computer systems whose imports might have been too heavy a drain on the balance of payments.

Its first computers were Danish Gler machines, designed in 1958-59 at Copenhagen University, though these were soon supplemented at its main Copenhagen centre by four CDC 6400s.

Its service bureau activities were kept strictly within the

ful to spread outside Denmark to neighbouring Scandinavian countries, and West Germany and Austria. RC has thus from the beginning had a small manufacturing activity for Gler computers, and their compatible successor the RC 4000 designed in 1968. Until recently these were built only to meet the requirements of its service bureaux, and also those of Eastern customers, where the Gler acquired a following in the days before the Nato embargo on US-designed computers was relaxed.

The development of RC hardware products reflects fairly closely the evolution of the Scandinavian small to medium user market from batch processing on remote service bureaux to online transaction processing on their own premises.

To process the growing volumes of paper tape reaching its service bureaux RC developed the RC 3000 paper tape-to-magnetic tape and magnetic-to-paper tape converter in the late 1960s, which was marketed for a while by Olivetti throughout Europe. In 1970, it added a Data General Nova 1200 as controller (RC had become Data General Danish agent that year) for easier character code and format conversions, and this became the first version of the RC 3600.

By 1972, many RC users required heavier terminals than paper tape transmitter-receivers. For them, RC designed an RC 3600 terminal version, that could transmit paper tape to the

from the line. In 1973 the RC 3600 was offered as an RJE terminal that could exchange programs and data directly with most mainframes by emulating the RJE terminals.

Also from 1973 RC offered its bureau users the Datapoint 2200, for which it had become the Scandinavian, West German and Netherlands distributor, and from 1974 it offered software on the RC 3600, allowing it to be used as concentrator for data from the cassette on several Datapoint 2200s. Since 1976, the RC 3600 has been available as a multi-station key-to-disc intelligent data entry system.

The final stage has been to offer full distributed transaction processing facilities with the RC 8000, a 24-bit word minicomputer.

The 8000 is fully upward

compatible with the RC 4000 Gler systems; hence the 24 word length. All application software developed for Gler systems at RC bureaux is available to RC 8000 users.

In architecture RC has followed Norsk Data's multi-processor architecture. Nord-50/Nord-10 systems come out with something very similar to the DEC PDP-11/70 2-Megabyte mini.

The RC 8000 relies on a 16-bit word front-end processor, in case, one or more RC 3600s, all I/O. Like Nord-10 and PDP-11 users, the RC 3600 users can increase the processing power of their systems simply by plugging in an 8000 processor and

Continued on page 31

RELIANCE COMPUTER LIMITED

FOR SALE

370/148 2 mag.
370/145 512K
370/115 96K
360/20 16K
3333-001
3330-001

TO PURCHASE

IBM 370/168
370/158
370/135
3830/002
3420-007

Any any I/O equipment

9 Commonsense, Sheffield S10 1GA
Telephone: 0742 669147

By Fred Lamond

Norsk success with 'mainframe' minis

THE first manufacturer to have pushed its minis into mainframe territory is Norsk Data of Norway, which has entered the UK market through the agency of Richard Norton and Associates (CW, October 20, 1977).

Norsk Data was founded 10 years ago, and its main product line has been a family of 16-bit minis, the Nord-1 and Nord-20. These were succeeded in 1973 by the Nord-10, Nord-12 and the Nord-42 OEM version.

By the end of 1977, it will have delivered over 800 computer systems, including some 300 Nord-12 and close on 200 Nord-10 and Nord-42 systems. Of these deliveries, 60% have been to the Norwegian home market; 20% to other Scandinavian countries; and the remaining 20% to Europe — including over 40 Nord-10 to CERN in Geneva.

At first sight, Nord-10 and Nord-12 specifications seem well in the mainstream of 16-bit word minicomputer design and performance. A 16-bit address length limits each individual program or program segment to a maximum length of 64K words, which is also the maximum main memory size of Nord-12 and Nord-42.

On the Nord-10, a memory mapping facility allows main memory to be expanded to 256K words, equal to the Data General Eclipse but well below the Digital Equipment Corporation 11/70 2-Megabyte maximum.

But if the Nord family was just part of the minicomputer mainstream, would the Nord-10 have won the CERN order for 24 minis to control its 400 GeV super proton synchrotron high-speed nuclear particle accelerator, against competition from DEC, CII and Télémécanique? And would other CERN departments have switched to the Nord-10 from DEC, Hewlett-Packard and CTL minis?

The reasons given by CERN for its choice of Nord-10 systems are revealing:

(1) The Nord-10's full-duplex CPU bus had five times the throughput of the DEC PDP-11/70 Unibus.

(2) The Nord-10 bus uses a differential method that is far more impervious to line noise than that of all the competing minis, an important considera-

tion in nuclear research environments.

(3) In 1972 when CERN was evaluating the tenders, the Nord-10 was the only competing mini to be able to demonstrate a fully working multi-access time sharing operating system, Nord-Ops.

Norsk Data was ahead of its competitors in this field, because its Nord-1 and Nord-10 minis had been extensively used by Norwegian research institutes to save money and foreign exchange.

In 1974, Norsk released the current Sintran III operating system which combines real time control and background batch multiprogramming facilities of Sintran II with Nord-Ops multi-access time sharing. Many mainframe manufacturers have found such mixed mode operating systems difficult to implement efficiently on larger and more expensive systems.

Sintran III also includes the Sibex database management system, which is not only applications independent, but conforms to full Codasyl specifications. In 1975 came the Nordnet data communications software, which allows any number of Nord-10 systems to communicate online and to pass source programs to each other automatically.

A Nordnet can include mainframes of any size, as indeed they are in the Scanet network which links all Scandinavian research institutes in the manner of EIN in the EEC.

Now that Norsk Data has also entered the British market, we must expect ICL to be added shortly to the list of mainframe manufacturers which Nord-10 minis can front-end, or with which they can communicate.

Like DEC, Norsk Data can supply "mainframe power". A Nord-50 offers the processing power of an IBM 370/158-3 or 3031 for little more than £100,000. The company has already delivered 10 Nord-50s and three of the earlier Nord-5. Users include the Norwegian nuclear research institute, and both the Norwegian and Algerian weather forecasting centres.

The architecture of the Nord-50 provides a forecast of probable 1980s trends. It is not a classic large general-purpose mainframe, but rather a mini-

supercomputer, a cheaper smaller scale version of the CDC Cyber 78 or Cray-1.

Not only does it perform its own high-speed calculations by means of a pipeline of functional processors, it works like other supercomputers as a "slave" of a front-end Nord-10 or Nord-10/S.

The Nord-50 shares part of its main memory with its Nord-10 or Nord-10/S front-end but this effectively limits the Nord-50 to not much more than 512K bytes of main memory.

Norsk Data is working on this memory bottleneck, and may announce a less restrictive front-end some time in 1978. In the meantime, it is quite prepared to offer Nord-50s as back-end high-speed processors to users of other minicomputers, though none have been ordered as yet.



EUROPE represents a pool of technical skills and management talent that is vital for efficient production. That is the view of Michel Faucon, director general of staff services for IBM Europe.

Speaking at IBM's Mainz plant in West Germany, Faucon and other speakers outlined the concepts involved in production and management employed by IBM in Europe.

"In Europe alone, IBM has 14 plant locations," he said, "our aim is to manufacture in Europe everything we sell. Substantial manpower is required for this and from a total of about 92,000 employees in Europe, 22,000 are engaged in manufacturing."

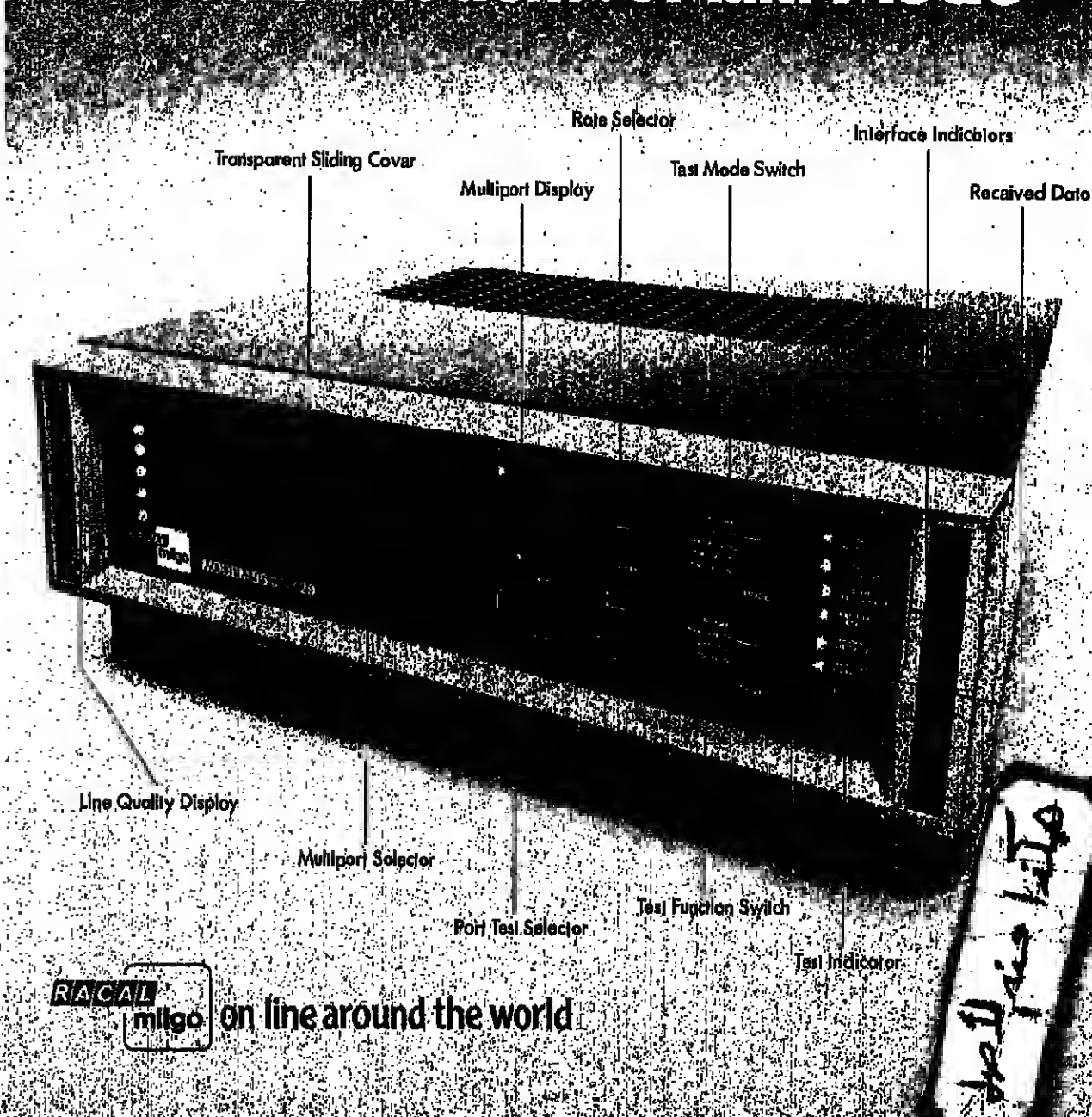
Of this 22,000, 2,400 are employed at Mainz, which produces 370/148s and 148s, the 3340, 3344, and 3350 disc units, and the 3348 disc pack.

The establishment of a "single worldwide product design" concept was given as an example of the company's production philosophy. Under this, a product could be designed at any one of IBM's 25 laboratories for application on a worldwide scale. Information about such projects was communicated to production plants via IBM's global teleprocessing network.

Helmut Fridrich, group director of manufacturing for IBM Europe, described the "elster plant" concept which is used to encourage internal competition. Mainz liaises regularly with the San Jose plant in California on disc drive data.

Our picture shows the assembly at Mainz of the read/write head-arm carriage for the 3350 disc drive.

Three years ahead of its time - The V29 Modem 96 Multi-Mode



Racal-Milgo's V29 Multi-Mode is the latest version of the 96 Multi-Mode for the last three years Europe's best-selling 9600 bit/s modem. Conforming to the new CCITT recommendation V29, it is a truly outstanding modem, designed for point-to-point applications and for multi-drop polled networks.

Five multi-channel combinations are available, controlled by a front panel

configuration selected. In the event of line quality deterioration, the data rate can be reduced to 7200 or 4800 bit/s. The Modem 96 Multi-Mode/29 has a range of sophisticated diagnostic features including local and remote control of line and DTE loop-back functions, a built-in test pattern generator and error detector, a receive level indicator, a line quality meter and

Contact Racal-Milgo now for full details of this outstanding Modem.

Racal-Milgo Limited
Barnet Road
Reading
Berkshire
England RG2 0SS
Telephone: Reading (0734) 85282
Telex: 847667

ON SHOW AT SYSTEMS '77...



Whatever your field of activity or your application, the Megadata "System 700" is adaptable to your needs, and ensures full compatibility with already existing equipment, thus considerably improving the systems overall efficiency.

Geurotech

DEUTSCHE EUROTECH GmbH
MÜNCHEN 40, D-8000
4000 DUISBURG 11
FRANKFURT - HAMBURG - MÜNCHEN

TELE 0211 80 11 08
TELEX 808 0440



Malmö accent on 'friendly data processing'

BETWEEN 1968 and 1978 the city of Malmö in Sweden developed its data processing in the traditional way, upgrading from central mainframe to central mainframe.

But in 1978, the city felt that central processing would not give the many varied users effective and what is called 'friendly data processing' at a reasonable cost. It also worked out that the applications it had planned would need a system which could handle 130 terminal transactions a second.

It also found that an IBM 370/148 handling 10 transactions a second would cost five million Kronor (£870,000) compared with a mini handling four

transactions a second and costing 200,000 Kronor (£23,000). The number of 370/148s needed to handle 130 transactions would cost 10 times as much as the 32 minicomputers needed.

These simple comparisons, plus the fact that by 1978 manufacturers were developing database software, Cobol compilers and large storage capacity for minis, led Malmö to move to distributed processing.

So far it has installed 14 Data General minicomputers which support 90 terminals and handle applications ranging from maintaining waiting lists for old people's homes to billing harbour charges at the city's port.

IBM role in brave new Afghanistan

Ian Hugo reports from Kabul

IF you receive a stock of two tons of assorted door handles and sell 100, how many have you left and what is their value? This is one of the problems being tackled by the sole commercial computer installation in Afghanistan.

The IBM 360/30, 32K memory, with four tape drives, card reader and printer was bought five years ago by a consortium of airlines, banks and hotels and was given strong IBM support to launch a brave new Afghanistan.

The effort has given IBM 100 per cent of the market, for the other machine in the country is an I130. This was a gift to the Met office from the World Meteorological Organisation.

To understand why there are not numerous 360s as a reward for this initiative, you have to understand Afghanistan, as IBM has learnt from hard experience.

Afghanistan has an estimated population of 17 million — es-

timated because there has never been a population census. In a couple of years, with the help of the UN, there may be one.

In the neighbouring Hindu Kush mountains, in chaikhana (tea shops) covering below two ancient 200ft high Buddhas, you can buy floor space overnight next to a wood store, and as much tea as you can drink, for 7p — hardly the place you would expect IBM to look for new markets.

But with all the basic government data to collect and some significant industry (banking and textiles), the opportunity seemed to be there.

The problems started with the name. Proudly calling itself IBM, the installation quickly found itself known as ABM, which was presumed to mean Afghan Business Machines.

The trouble was that in Farsi, one of two local languages, the characters for A and I, as popularly written, are interchangeable. To avoid further embarrassment, the name was changed to Afghan Computer Corporation.

I spoke to Mr Vaz, an Indian, over the inevitable pot of tea. Was he the chief systems analyst, I inquired? No, he smiled, just the only systems analyst.

He explained that the stock control problem arose because import quotas and taxes are concerned primarily with weight, so that conversion to unit value was difficult.

This is one reason it has been impossible to produce figures for the import/export balance of the country; this, plus long borders with Iran and the Soviet Union and just two frontier posts. In turn, this complicates an attempt at a census, since an important temporary export is people.

We were joined by Mr Chopra, the IBM maintenance engineer, also an Indian. He explained that the installation tended to look to India for its trained staff but that the programmers and operators were Afghans.

How was the electricity supply, I suggested tentatively? At

this, the picture brightened. It was very good, he said, and also the telephone system. Both had been designed and installed by Siemens.

The real problems, he said, were of resistance to change (now where have I heard that before?)

In five years of operations, the installation has achieved a usage of only 100 hours per month, all statistical, accounting and inventory work.

This work posed real problems because quantities and values that started off vague tended to get vaguer as they progressed through the systems.

Hard figures, if you were foolish enough to attempt that, could so easily rebound on your own neck; everybody had to make a living somehow. So there were no simple applications in practice.

What of the future? Well, there was a lot more statistical and accounting work to be done, if people could be persuaded to produce figures.

What about government statistical work? Well, they were doing some for the Ministry of Education but otherwise... a polite shrug of the shoulders.

Optimistically, Mr Chopra suggested that with government support there could be "a great leap forward" and Mr Vaz enthusiastically concurred. Both have worked for over two years at the installation and have obviously retained their faith in its ultimate success.

Meanwhile, IBM has not given up either. The former educational manager for IBM India, Mr N. V. Balasubra, has moved in as resident IBM manager at the installation and has started giving PL/I courses at the Engineering Faculty of Kabul University.

The Engineering Faculty was chosen because the language of instruction is English, rather than Farsi, Pushtu, French or Russian — languages used variously by other faculties. The Dean of Engineering was so pleased with the course that he has made them a "compulsory choice." Soon, too, the installation hopes to have a System 34 and perhaps one of the banks will get its own machine.

French govt earmarks £73.5m for DP sector

EMPHASISING the commitment of the French government to the national computer industry, the Industry Ministry has announced that 82% of its budget for 1978 will be devoted to various aspects of computing.

The sum proposed is 630.8 million Francs (£73.5 million). Of this, 60% (383 million Francs) is set aside for CII-Honeywell Bull, and 20% (118 million Francs) for keeping the former CC factory at Toulouse in business.

The remaining 20% is allocated to development of the component industry, per-informatic sector growth contracts and promotion of the use of computing.

The lion's share of this, 50 million francs, goes to develop-

ment of very large scale integrated circuitry. The amount allocated by the French is about a quarter of what the Japanese government is investing in development of VLSI.

Growth contracts already agreed with Sintra-Transac, Logabax, SEMS, Pyral, GSE, Intertechnique, IER and shortly, Benson, will account for 34 million Francs.

Promotion of the use of computing is in the hands of a body called the Technical Computing Centre. It is similar to the UK's National Computing Centre and will get 23 million Francs, £2.7 million. By contrast, the NCC is to get £1.7 million over three years from the UK government.

South Korean order for ITT

THE Belgian-designed ITT Metacanta 10C telephone switching system, which includes reed relays similar to the UK TXE-4 system and is controlled by a specially-designed ITT 1802 stored program control computer, has won a major victory in South Korea against competing systems from GTE and AT&T of the US, L. M. Ericsson of Sweden, Siemens of West Germany and Fujitsu and Nippon

Electric from Japan. The South Korean contract is worth "well over \$100 million" and involves the establishment of manufacturing facilities for the equipment on behalf of the State-owned Korea Telecommunications Company. But the first system to be installed will be built by ITT's Belgian subsidiary, ITT Manufacturing Company, Belgium.

They all talk the same language.

PECHINEY
UGINE
KUHLMANN

RICARD
ANISETTE LIQUEUR

K
VOGUE

M
MIGROS

British
airways

SKF

Lloyds Bank

MOTOROLA
Semiconductors

Shell

GAZ DE FRANCE
ELECTRICITE DE FRANCE

PEUGEOT

SNECMA

MARK IV

Whatever their business, wherever they are, they all talk the same language. They're members of the world's largest software product user group — 1200 leading installations on every continent, who have chosen Informatics MARK IV Systems.

60 to 90% savings. MARK IV is today's leading software implementation system, because it gives management the information it needs, when it needs it. At 60 to 90% savings in time and cost compared to conventional programming methods. That's been proved during a decade of cost-effective use.

Over the years, MARK IV has been continuously updated, with over 1500 improvements and 19 major releases. Today, it's by far the most comprehensive and versatile software product available, with transparent interfaces and on-line query facilities to the DBMS in widest use.

D-70 in 15 years. MARK IV Systems are developed and maintained by Informatics, the world's largest independent supplier of proprietary software products — and one of the fastest-growing. In just 15 years Informatics have expanded from a small professional service company into a \$70 million global operation. Informatics now offer over 20 software products as well as a wide range of professional and data services. We keep adding to the list. Wide product range. For example, we've introduced MONITOR IV™, a family of advanced teleprocessing monitors, including INTERCOMM™, BETACOMM™ and MINICOMM™. SHRINK™ the data encryption system for data transmission and the ultimate in data security and storage optimisation. SERIES IV™ today's most flexible distributed processing software system for data entry and validation. ACCOUNTING IV™ general ledger, accounts receivable, accounts payable, the easy-to-install, comprehensive and expendable financial accounting system.

Your DP operation is results-oriented. Informatics products are, too. Which is why it will be worth your while to see us about your software needs, and the Informatics products that suit them best. You'll find we talk the same language.

Please send me documentation on:
☐ MARK IV Systems ☐ Other Informatics software products. (Please specify).

Name _____
Title _____
Company _____
Address _____
Tel. _____
Computer _____ Operating system _____

INFORMATICS (U.K.) LTD
Farnham House, Collinge Road
Harrow, Middx HA1 1BD/UK
Tel: 863-0066 Telex: 8813496

informatics

All you wanted to know about your store-but didn't have time to find out

More than ever before, successful modern retailing demands management decisions based on accurate, comprehensive up-to-the-minute information.

The data that creates this information is generated, like your profits, at the checkout. This is where the Sweda 500/80 point-of-sale system operates — capturing that data and processing it.

The Sweda 500/80 provides detailed printed reports — whenever they are needed — covering the vital areas of sales analysis, stock control, cash control and staff performance. Sweda, with over forty years experience in solving the problems of retailers, has designed these reports specially for you.

Send in the coupon now for a sample set of typical Sweda Management Reports. It's the best way to find out just how comprehensive they are. Then we hope you will agree that Sweda has the answers.

To: Sweda International, 27 Goswell Road, London EC1M 7AL. Tel: 01-253 3090

Please let me have a sample set of Sweda 500/80 Reports.

Name: _____
Company: _____
Address: _____
Telephone: _____
Type of Business: _____

SWEDA

CW 12/11

How Japan plans for an information society

KAORU ANDO holds clear views on the vital role of the DP industry. It is "socially desirable" in itself, it consumes few resources and does not pollute. But its chief benefits lie outside itself, in the gains its applications and technologies will bring to other sectors.

For the economic future, he believes, belongs not to the capital intensive economies but to the knowledge intensive ones.

Already, Japan's capital intensive industries are under attack by competitors from the developing world. It is only a matter of time before developing countries acquire capital intensive facilities which, with low labour costs, will pose a major

threat. To protect its position in world markets, Japan must, he says, develop a "knowledge based society" of knowledge intensive industries.

Examples include education, R & D, printing and publishing, broadcasting, advertising, information processing, professional services and communication. These all high added value goods and services and added value is recognised as the key to future wealth.

To achieve this, Japan has plans to develop into an information society exploiting information processing and communication technologies to the full. Moreover, while national plans are never easy to carry

through, Japan has several factors in its favour. A labour shortage is foreseen. There is what Ando calls the Japanese "drive to improve" coupled with the consensus approach to decision making. This means the run-up to a decision may be lengthy but its implementation will be swift and assured.

In public life people understand the need for such a plan. Some 75 members of the Parliament take an active interest in the development of the information processing industry and form a group which advises the government. They recognise that DP is a "key national industry for the future" and see the link between its develop-

ment and the development of the whole economy into an information society.

For instance, Ando notes, LSI changed the watch and camera industry. But now "the LSI days are over" and under development is a "super LSI which will give real help to the electro-mechanical industry."

Nonetheless, to make a national strategy work demands the right climate and a public which understands it and supports it. Education and communication are very necessary. For "the public is near-sighted" and the skills shortage could be critical. By 1985, for instance, Japan will need 500,000 professionals in DP and other professions with a

basic grasp of how DP can help their jobs. Without action, a shortfall of 380,000 would occur.

So how does Japan go about creating the right climate and educating tomorrow's users?

The DP industry and profession plays an important role. It defines its social responsibility in education terms. Giving donations to projects unrelated to DP may be worthy but, says Ando, it is "just not responding actually to social needs" of the kind the DP industry is equipped to meet.

The DP industry responds to social needs through education. It acknowledges a need to educate the whole community in DP. Indeed "profitability and social responsibility are two wheels on which business must be riding." Business in future must respond to social needs as well as to profit considerations if its purpose is to be understood by the public. Initiatives do come from the profession of industry but there is no co-ordinating group. "The atmosphere creates things."

Here are some elements in the ways Japan educates tomorrow's users:

To build public awareness there is a national Information Week. Instituted by the government in 1972, this occurs in the first week of October each year. Conferences are held in major centres throughout Japan and are open to the public. Overseas speakers attend, films are shown and equipment is demonstrated. The public is able to use and become familiar with computers supplied by manufacturers.

Each year the conferences have a theme such as "machines and human beings" and "computers and society." These distributed conferences keep the computing idea before the people and are part of a long-term education and communication plan.

Formal public education is also offered. The quasi-government broadcasting body NHK runs a basic programming course on its educational TV channel. By now it is "very well known" and anyone can take the course. "There's no need to enroll—just switch on and buy a low cost text issued by NHK."

The school system trains schoolchildren in DP by linking computer education to applications and the subject interests of pupils. There are three types of course: DP in mathematics; DP in managerial information processing for commercial students, and scientific information processing for technical students.

Educating the public is not only vital but time consuming, "and it requires much advanced investment." However, "public interest is growing" though Ando would like to see more public discussion in the media. Now, he says, "we have to teach the teachers."

One body which does so is the Fujitsu Institute of Computer Science which he founded over a decade ago. The Institute is a professional training school open to the public and intended to be "a central powerhouse." It now turns out 400 to 500 "graduates" each year who include high school teachers, company employees and union leaders. As well as teaching, the Institute develops materials for use in courses elsewhere.

To complement the Institute

The Japanese economic challenge has made a major impact on the Western world. At Datafair 77 in London last month Kaoru Ando (pictured right) outlined Japan's plans to build an information society whose performance may again be a major factor in the world economy. NIGEL LAURIE, a communications consultant with a special interest in computing, discussed with Ando how Japan is preparing today for the demands and opportunities of tomorrow.



KAORU ANDO is a distinguished leader in the Japanese computing scene. Born in Tokyo in 1914, he reflected its international outlook by studying econometrics at the University of Indiana. In the following year he joined IBM, passing through the IBM Sales School with Watson Jr. Then he worked setting up IBM in Japan where he held the posts of director, education, personnel, marketing as well as managing director.

After 28 years with the company he left IBM in 1942, and, at government request, helped build up Japan's computing industry. He was appointed managing director of Fujitsu in 1970 and has been executive advisor. He is president of the Fujitsu Institute of Computer Science, one of IFIP and the Japanese representative.

Ando's many other roles include director of the Information Processing Society of Japan, member of the Advisory Committee on Computer Education at the Japanese Ministry of Education, and member of the Ministry of Labour and the Committee on Employment Promotion for the Physically Handicapped.

Ando's view of computers reflects the convergent technologies. "Basically, there are three C's, he says, 'technology, communication, and computer technology'. They should be merged, he believes, to form the core of the DP industry's development.

Fujitsu, the computer adviser, is, he notes, a big company.

Ando would like to see a post-graduate Institute of Information science. Graduates from all disciplines could be an interdisciplinary high grade centre. This would produce a body of qualified DP specialists to meet the critical future demand.

In Honolulu the Japanese Science Institute provides a pipeline between Japan and the USA in exchange of ideas. Ando there studies the Japanese doing business and Japan studying the American way of managing. "A dream stage is 'a counterpoint Europe' to encourage a two-way flow of ideas."

Will the Japanese respond to change as predicted? But Japan's speed he expounded. It has a strong assurance and a high-tech outlook. Change, he says, is "managed" and "careful." Experiments and tests of six or 12 months are widespread. Use of message switching between transactions, he says, is "very slow" and "very slowly" going very slowly.

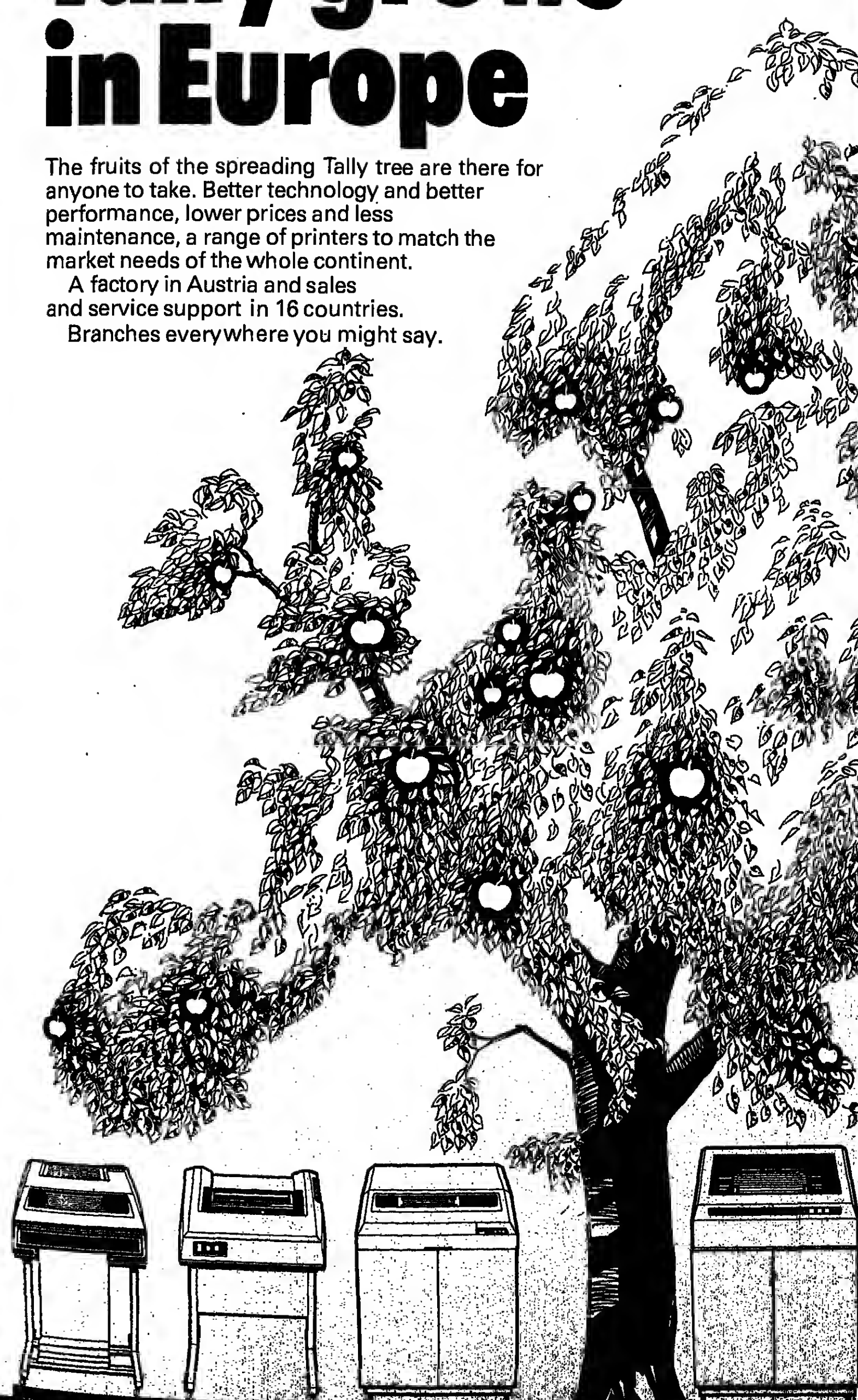
Ando's view of the human factor in computing is that it creates people.

Tally grows in Europe

The fruits of the spreading Tally tree are there for anyone to take. Better technology and better performance, lower prices and less maintenance, a range of printers to match the market needs of the whole continent.

A factory in Austria and sales and service support in 16 countries.

Branches everywhere you might say.



A range of printers to satisfy all your computer output needs. Optimised technology at each speed means optimised reliability. Simplicity of design means round-the-clock performance — with no routine maintenance.

Tally printers plug in to almost any mini-computer or data terminal. Tally service is direct and fast — anywhere in Europe. Tell us your application requirement: we'll tell you which printer will meet it.

TALLY LIMITED
7 Grenville Road
Reading RG1 8NQ
Berkshire, England
Telephone: (0734) 580141

TALLY GmbH
6 Frankfurt/Main
Kruppstrasse 138
W. Germany
Telephone: (061) 417191

TALLY GesmbH
Zetschegasse 17
A-1232 Vienna
Austria
Telephone: (0222) 672647

TALLY ITALIA S.r.l.
Via Giardin
Milano
Italy
Telephone: (02) 4045546

TALLY S.a.r.l.
40 Rue des Vignobles
78400-Chatou
France
Telephone: (01) 913 5827

Belgium
S.A.T. Electronics S.A.
Brussels
Telephone: (02) 3762030

Denmark
Dataleg
Copenhagen
Telephone: (01) 12 48 03

Finland
Jartec Oy
Helsinki
Telephone: (90) 542 007

Greece
Doxiadis Brothers, Graphotechniki S.A.
Athens
Telephone: (01) 3226601

Holland
Tracer Europa B.V.
Amsterdam
Telephone: (020) 418865

Ireland
Creative Systems Limited
Malahide
Telephone: Malahide 45311

Norway
Norsk Marrom A/S
Oslo 6
Telephone: (02) 670486

Portugal
Equipamentos de Laboratorio, Lda.
Lisbon
Telephone: (19) 976551

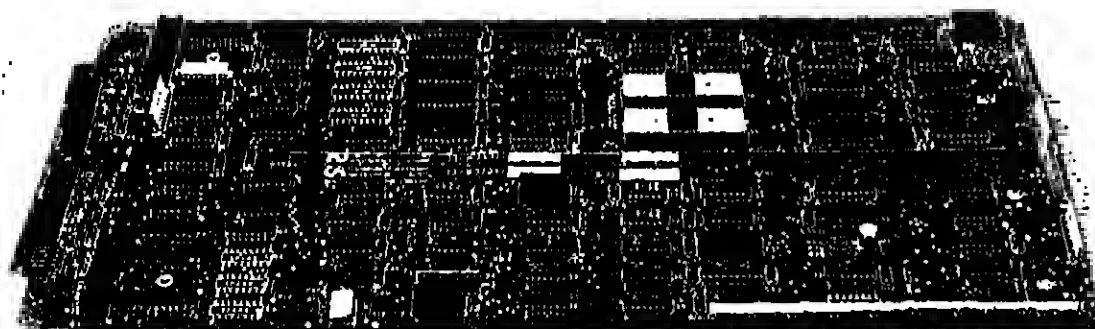
Scotland
Lorraine (Fife) Limited
Dunfermline
Telephone: (0383) 823121

Spain
Uniracsa S.A.
Madrid
Telephone: (91) 242 52 02

Sweden
Datacenter A.B.
Ostergatan
Telephone: (076) 051655

TALLY

A mini computer at microcomputer prices.



Another Naked Mini breakthrough from ComputerAutomation. Performance up again. Price down again. A powerful 16-bit minicomputer on a half-card (7 1/2 in x 15 in), but at a lower price than many 8-bit micros.



One of a new family of mini-computers, developed specifically for the OEM market. The Naked Mini LSI-4/10. So competitive that if you are currently buying microprocessor chips and building your own computers, you may now find it hard to justify the cost of your development effort. NM-4/10 features a high speed processor with a powerful instruction set, up to 4K words of integral memory and four I/O

channels — a complete computer on ONE board.

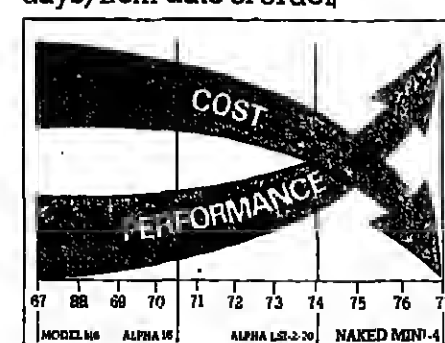
Integral I/O
The four on-board I/O channels are typical of the 'OEM features'. Used with ComputerAutomation's unique PicoProcessor-controlled intelligent cables, interfacing costs can be cut by up to 50%.

Compatibility
Both hardware and software for the new LSI-4 family of minicomputers are fully compatible, providing OEM customers with complete flexibility through the range. If a program will run on the LSI-4/10, it will run on its bigger brothers LSI-4/30 and LSI-4/90.

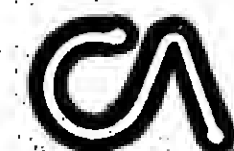
Reliability
Every Naked Mini-4 mini-computer carries a full 12-month warranty. That's how confident we are of their reliability. It's an

assurance you can build into your products.

Fast delivery
An average of 30 days (yes, days) from date of order.



with deliveries planned to a guaranteed schedule for major OEM customers. The combination of unbeatable price/performance, compact size and a company totally dedicated to supplying OEM computers make the NM-4 ideal for YOUR application.



ComputerAutomation
Naked Mini Division
The OEM Computer People.

Naked Mini Division, CAI Limited (ComputerAutomation)
European Headquarters, Herford House, Denham Way, Rickmansworth, WD3 2XD
Hertfordshire, England. Telephone: 0438 550111

ITT processor for large networks

A FURTHER addition to ITT's range of communications systems and equipment has been announced by the company's German subsidiary, Standard Elektrik Lorenz.

The new hardware addition to the line is a third communications processor, 3809, which joins the 3805 and 3807, but offers further facilities for large networks. It has a capacity of up to 512 full-duplex lines, and main memory extends to one Megabyte. Eight multiplexed channels are also offered.

The processor has a throughput of about 400,000 bytes per second, and can support peripherals through block-multiplex channels with a transfer rate of 1.5 Megabytes per second.

Peripherals offered with the 3809 include disc drives with

capacity up to 60 Megabytes, tape drives, card-reader and 600 or 800 lpm printers.

A portfolio of software modules called Data Switching System is included in the announcement, running under a special Communications Operating System, COS.

Modules include Data Switch/Message Control Program to interface the network to the host computer, Communications Access Method, which takes over this function from the host mainframe, Network Manager, and File Access Method.

ITT Business Systems says that the 3805 and 3807 already introduced in the UK are likely to meet all user requirements for the foreseeable future, but it is considering a 3809 for possible introduction in the long term.

Running a DP centre

ALL aspects of running a computer centre are covered in an information service from Auerbach in the form of bi-monthly supplements.

The first supplement deals with organisation and looks at planning, efficiency and communication with, and supervision of, staff.

The production management supplement deals with the main aim of computer operations: to meet the needs of the organisation. Planning and scheduling work flow, input and output control and the distribution of output are covered.

Interfaces between the end user and both the computer and

the operations department are dealt with in the third supplement. The next two are related, in that one covers job accounting and justifying the operations budget while the other looks at auditing and measuring performance.

The final supplement deals with management functions ranging from designing the computer centre to supplying time sharing services.

The series of supplements is called Auerbach Data Centre Operations, and costs £120 for a year. A 30-day free trial is offered. Further details can be had from Heyden and Son, Spectrum House, Hillview Gardens, London NW4 2JQ.

Are time-lags in implementation of new ideas and technology, repeated failures and differential growth and development in various countries peculiar to the computer industry? FRANK LAND, of the London School of Economics, examines the

Factors in the transfer of technology

AT the end of the recent IFIP Congress in Toronto, I took a 52-hour Greyhound bus ride to the Canadian Rocky Mountains. This gave me a chance to try to reflect on some of the massive volume of material we had received at the congress.

One particular thought kept recurring. Despite the incredible rate of technological invention, and the prospect of an even more rapid rate of progress in this direction, the computer industry revealed a series of intriguing time-lags: the lag between an invention becoming known — for example, bubble memory — and its actual incorporation in a marketable product; the even greater lag between the availability of new capabilities and the recognition and use of the capabilities in industry and commerce.

Even greater is the lag between the application of a new technology in one developed industrial country and the application of the same technology in a developing country. Even within a single country — even one industry — the rate of

take-up of new ideas and technology shows enormous variation.

At the same time, once the new technologies begin to be used, they undergo the same kind of problems of introduction as those they replace.

Are the time-lags, the repeated failures, the differential growth and development rate peculiar to the computer industry, or do they apply to all technological developments? Some organisations or countries can absorb new technologies, whereas others fail to utilise them. Overall we note an accelerated growth in technology in the 20th century, yet the progress made has been far from uniform. The accelerated pace of technological progress appears to have made the rich richer and the poor poorer.

Within the past decade people have begun to be interested in the process by which technology is transferred. A new area of studies is developing which attempts to look into the process by which technology transfer is initiated and implemented and which looks at the factors which inhibit or slow down the process, and the factors which aid or accelerate the process. Some previously accepted doctrines regarding the direction of development of technology have been challenged, for example, by Schumacher, who has demonstrated that a technology relevant in one environment may be totally irrelevant in a different environment.

The systematisation of the study of technology transfer has enabled us to identify the three most important components in the transfer process:

1. The source — which has the knowledge and skill relating to the technology in question. The source may be the research and development section of a large industrial organisation, or may be a pure research establishment, or an academic institution, or an organisation which sells technology, such as a computer manufacturer or software house. Or the source may be a country which is utilising a particular technology.

2. The target — which at present lacks the knowledge or skill to exploit the technology. The target may be a production division of the company with the R&D department, or may be a different branch of a multinational company, or may be a developing country.

3. The agent — responsible for transferring the knowledge and skill from the source to the target.

If we look at the process of transfer more closely, we can begin to identify the factors which act as constraints on the transfer of the technology. Some of the most important of these factors are:

Resources constraints — lack of capital and finance, lack of labour with the required skills;

Infrastructure constraints — lack of adequate communication facilities, lack of education and training facilities;

Technical constraints — products engineered for a temperate climate may not operate efficiently in a tropical climate;

Cultural constraints — comprising attitudes, norms, and

may directly inhibit certain kinds of development or cause conflict between the agent, with one set of cultural norms, and the target, which may have a different set of norms. (Consider the problem of bribes in different countries.) These differences may operate at the level of organisations or at the level of countries. Does the relevant slowness of UK industry to adopt UK inventions, as against the US or Japan, derive from cultural constraints, resource constraints or a mixture of the two?

Economic constraints — size of the market and problems of scale;

Educational constraints — the level of literacy and numeracy. Again, this may be as significant a difference between a developed and a developing country as between two organisations within one country — one which has recruited its managerial staff with a background of higher education, perhaps from business schools, and the other which has recruited its managerial staff with different educational qualifications;

Legal constraints — such as laws relating to privacy, to pollution and to ways of doing business via company legislation;

Institutional constraints — arising from the methods of operation of the country's institutions. Included in this, for example, would be the codes of practice used by the accounting profession and the extent of bureaucratic control and red tape;

Political constraints — connected with the political system in operation, and factors such as nationalism, patriotism and the extent of government control;

Language constraints — which prevent the free communication of ideas and knowledge across political boundaries and, at times, within one country.

All these constraints are in some ways interdependent. The legal and political constraints are in some sense the result of cultural patterns.

Why, for example, does a major industry appear to reject a new development which appears to the outsider to make the product of that industry cheaper and more reliable? The factors causing the rejection may be very complex, consisting of institutional, cultural and economic elements. What factors give rise to the typical management Catch-22? If it is not written off, we cannot replace it because the costs have

not been recovered, if it is written off, we cannot replace it because it is now free.

Awareness of the constraints in transferring technology from source to target gives rise to the concept of "fit". The new technology must fit into the complex environment of the target. Awareness of the inhibiting factors also suggests some of the tools which may aid the process of transfer and help to overcome some of the constraints. The most important tools are:

Education and training: Education has many aspects. It can be used to reinforce existing barriers or be used to prepare for change. It is one of the principal conditioning agents affecting attitudes towards technology and change. Education is not a one-off-for-all operation performed on school children, but a continuous process through life in terms of technology transfer.

Technique of particular value may be post-experience and mid-career and training courses.

2. The availability of information: Information plays a critical role in technology transfer. Without information the process cannot even start.

3. External agencies: There are many agencies which foster research, economic development, and ultimately technology transfer. These agencies range from international bodies such as the World Bank, government offices providing grants or relief, and private or public institutions such as merchant banks and the stock exchange.

The computer industry is a particular interest in the study of technology transfer. It represents a rapidly developing technology subject to all the difficulties faced by other technologies. At the same time, it provides some of the most important tools yet developed to aid the process of technology transfer.



Frank Land

problems of what he calls technology transfer. Mr Land is chairman of the UK committee set up to help organise contributions to the Third Jerusalem Conference on Information Technology, to be held on August 6-9 next year.

General Automation has no plans for a second generation at present, but is completing a portfolio of banking software which will be available to Swift and non-Swift users.

ICL intends to develop a new modular SID combining elements from both the 1500 and the 7502 terminal systems.

NCR and EC are also preparing Swift solutions. DEC is said to be working on a system to run under RSX-11. (CW, October 27.)

US MINIMAKER Microdata has completed negotiations to buy 75% of key-to-disc manufacturer CMC UK for \$4 million, but has abandoned plans to buy CMC France and CMC Germany.

CMC UK has subsidiaries in Sweden and Denmark and Microdata will market through distributors for the rest of Europe. (CW, October 20.)

A WORKSHOP funded by the EEC, aimed at improving the training of computer staff, is to be held in Munich on December 7-8. It is organised by the UK Institute of Personnel Management and the National Coal Board's subsidiary Computer Power, and is part of the second phase of a study into training started three years ago.

The working language of the workshop will be English, and further details can be obtained from Malcolm Campbell, Institute of Personnel Management, Central House, Upper Woburn Place, London WC1H 0HX, tel: 01-387 2844.

INTERNATIONAL data flow and the protection of personal information are now being dealt with at White House level in the US. All government departments have been asked to tell the White House of their plans to implement the Privacy Act, and a top member of the National Security Council has been given the job of finding out how US interests might be affected by trans-border data flow and by legislation controlling it. (CW, October 20.)

A CHEAPER alternative to bubble memory is now available from BASF in the form of a domain tip memory module, the DOT 48K. Word processing and microprocessor systems are seen as two big application areas. The module has a lower capacity and a longer average access time than the latest bubble memory chips, but at a cost of \$20-\$30 per module (40-15 millicents per bit) it is considerably cheaper. (CW, October 27.)

THE mint developed by the Swiss firm SEN Electronique of Geneva has been officially launched as the Helvet-1. It is compatible with the 16-bit Data General Nova and REX-1.

REPRESENTATIVES of top IBM management are scheduled to visit China very shortly. IBM has been eyeing the Chinese market for banking systems. (CW, November 3.)

THE UK government-owned Cable and Wireless Company is bidding \$18.3 million for Carterfone Communications Corp. of Dallas, Texas, celebrated for an anti-trust victory in the late 1980s, as a result of which equipment from non-AT&T suppliers was allowed to be attached to AT&T lines for the first time. (CW, November 3.)

UNITED KINGDOM: Dataproducts International Inc. "Scotling House", South Street, Reading RG5 2JX, Tel: 0492 227.

FRANCE: Dataproducts International Inc. 1, Rue de la Tour, Centre 202, 94070 Nogent-sur-Marne, France. Tel: 067 15 01 01, Telex: 220054.

GERMANY: Dataproducts International GmbH, Carl-Neuberg-Strasse 100, D-3000 Frankfurt. Tel: 069 133 1, Telex: 418344.

ITALY: Dataproducts International Inc. 00197 Rome, Via G. Pascoli 66. Tel: 06 47 00 00, Telex: 31311.

EUROPEAN MANUFACTURING: Dataproducts International GmbH, Carl-Neuberg-Strasse 100, D-3000 Frankfurt. Tel: 069 133 1, Telex: 418344.

ROUNDUP

Royal opening for Swift funds transfer network

THE Swift interbank funds transfer network was declared officially open in Brussels in October, by Prince Albert of Belgium. At the ceremony, the three approved Swift Interface Device, SID, suppliers, revealed their plans for the next generation of hardware and software.

Burroughs is to meet criticisms of the B7 SIO's throughput capacity by reviving the interface software in the MPL 2 language of the B80-800-1800 compatible range of small systems.

General Automation has no plans for a second generation at present, but is completing a portfolio of banking software which will be available to Swift and non-Swift users.

ICL intends to develop a new modular SID combining elements from both the 1500 and the 7502 terminal systems.

NCR and EC are also preparing Swift solutions. DEC is said to be working on a system to run under RSX-11. (CW, October 27.)

US MINIMAKER Microdata has completed negotiations to buy 75% of key-to-disc manufacturer CMC UK for \$4 million, but has abandoned plans to buy CMC France and CMC Germany.

CMC UK has subsidiaries in Sweden and Denmark and Microdata will market through distributors for the rest of Europe. (CW, October 20.)

A WORKSHOP funded by the EEC, aimed at improving the training of computer staff, is to be held in Munich on December 7-8. It is organised by the UK Institute of Personnel Management and the National Coal Board's subsidiary Computer Power, and is part of the second phase of a study into training started three years ago.

The working language of the workshop will be English, and further details can be obtained from Malcolm Campbell, Institute of Personnel Management, Central House, Upper Woburn Place, London WC1H 0HX, tel: 01-387 2844.

INTERNATIONAL data flow and the protection of personal information are now being dealt with at White House level in the US. All government departments have been asked to tell the White House of their plans to implement the Privacy Act, and a top member of the National Security Council has been given the job of finding out how US interests might be affected by trans-border data flow and by legislation controlling it. (CW, October 20.)

A CHEAPER alternative to bubble memory is now available from BASF in the form of a domain tip memory module, the DOT 48K. Word processing and microprocessor systems are seen as two big application areas. The module has a lower capacity and a longer average access time than the latest bubble memory chips, but at a cost of \$20-\$30 per module (40-15 millicents per bit) it is considerably cheaper. (CW, October 27.)

THE mint developed by the Swiss firm SEN Electronique of Geneva has been officially launched as the Helvet-1. It is compatible with the 16-bit Data General Nova and REX-1.

REPRESENTATIVES of top IBM management are scheduled to visit China very shortly. IBM has been eyeing the Chinese market for banking systems. (CW, November 3.)

THE UK government-owned Cable and Wireless Company is bidding \$18.3 million for Carterfone Communications Corp. of Dallas, Texas, celebrated for an anti-trust victory in the late 1980s, as a result of which equipment from non-AT&T suppliers was allowed to be attached to AT&T lines for the first time. (CW, November 3.)

UNITED KINGDOM: Dataproducts International Inc. "Scotling House", South Street, Reading RG5 2JX, Tel: 0492 227.

FRANCE: Dataproducts International Inc. 1, Rue de la Tour, Centre 202, 94070 Nogent-sur-Marne, France. Tel: 067 15 01 01, Telex: 220054.

GERMANY: Dataproducts International GmbH, Carl-Neuberg-Strasse 100, D-3000 Frankfurt. Tel: 069 133 1, Telex: 418344.

ITALY: Dataproducts International Inc. 00197 Rome, Via G. Pascoli 66. Tel: 06 47 00 00, Telex: 31311.

EUROPEAN MANUFACTURING: Dataproducts International GmbH, Carl-Neuberg-Strasse 100, D-3000 Frankfurt. Tel: 069 133 1, Telex: 418344.

A summary of main news items which have appeared since the last issue of Computer Weekly International on October 13

COMPUTER WEEKLY'S annual charity ball raised over £1,000 for the British Computer Society's Specialist Group for the Disabled. The ball, held at London's Royal Lancaster Hotel, was attended by over 800 people from the computer industry. (CW, October 20.)

MICROCOMPUTER systems are likely to make major inroads into the OEM minicomputer marketplace soon, according to a report issued by the First Boston Corporation, a New York company of investment bankers. (CW, October 20.)

A 32-BIT mini has been introduced by Digital Equipment Corporation. Called VAX-11/780, it comes with a new operating system named OS VAX/VMS and will support all PDP-11 peripherals as well as being able to run PDP-11 programs. Volume deliveries will begin in mid-1978, although first shipments could start earlier. (CW, October 27.)

THREE new 1100/80 and two new 90/80 models have been introduced by Univac, all featuring new compact

processor logic and 16K bit memory chips. New entry-level 1100/80 offers 70% of the power of the 1100/81, and better price-performance than IBM's new 3031. (CW, October 27.)

THE Zilog Z-8 single-chip microcomputer is scheduled to appear in quantity in March. The eight-bit device has an on-board memory capacity of 2K bytes of ROM and 96 bytes of RAM, with 32 I/O lines. The 16-bit Z-8000 is planned to appear next June. Its throughput capabilities and architecture will be similar to those of the PDP-11/70 mini, with a Z-80 compatible (at assembly language level) instruction set. (CW, October 20.)

A NEW subsidiary has been established in the California centre of the US semiconductor industry (known popularly as Silicon Gulch) by CAP, the UK consultancy. Known as CAP-CRP Inc and based in Palo Alto, the company will deal in CAP Microsoft products and services. (CW, November 3.)

PROBABLY THE GREATEST RANGE OF PRINTERS IN THE WORLD

T-80 THERMAL PRINTER

B-180 BAND PRINTER - 180 LPM

DATA BAND PRINTER - 1800 LPM

DATA BAND PRINTER - 3600 LPM

DATA BAND PRINTER - 7200 LPM

DATA BAND PRINTER - 14400 LPM

DATA BAND PRINTER - 28800 LPM

DATA BAND PRINTER - 57600 LPM

DATA BAND PRINTER - 115200 LPM

DATA BAND PRINTER - 230400 LPM

DATA BAND PRINTER - 460800 LPM

DATA BAND PRINTER - 921600 LPM

DATA BAND PRINTER - 1843200 LPM

DATA BAND PRINTER - 3686400 LPM

DATA BAND PRINTER - 7372800 LPM

DATA BAND PRINTER - 14745600 LPM

DATA BAND PRINTER - 29491200 LPM

DATA BAND PRINTER - 58982400 LPM

DATA BAND PRINTER - 117964800 LPM

DATA BAND PRINTER - 235929600 LPM

DATA BAND PRINTER - 471859200 LPM

DATA BAND PRINTER - 943718400 LPM

DATA BAND PRINTER - 1887436800 LPM

DATA BAND PRINTER - 3774873600 LPM

DATA BAND PRINTER - 7549747200 LPM

DATA BAND PRINTER - 15099494400 LPM

DATA BAND PRINTER - 30198988800 LPM

DATA BAND PRINTER - 60397977600 LPM

DATA BAND PRINTER - 120795955200 LPM

DATA BAND PRINTER - 241591910400 LPM

DATA BAND PRINTER - 483183820800 LPM

DATA BAND PRINTER - 966367641600 LPM

DATA BAND PRINTER - 1932735283200 LPM

DATA BAND PRINTER - 3865470566400 LPM

DATA BAND PRINTER - 7730941132800 LPM

DATA BAND PRINTER - 15461882265600 LPM

DATA BAND PRINTER - 30923764531200 LPM

DATA BAND PRINTER - 61847529062400 LPM

DATA BAND PRINTER - 123695058124800 LPM

DATA BAND PRINTER - 247390116249600 LPM

DATA BAND PRINTER - 494780232499200 LPM

DATA BAND PRINTER - 989560464998400 LPM

DATA BAND PRINTER - 1979120929996800 LPM

DATA BAND PRINTER - 3958241859993600 LPM

DATA BAND PRINTER - 7916483719987200 LPM

DATA BAND PRINTER - 15832967439974400 LPM

DATA BAND PRINTER - 31665934879948800 LPM

DATA BAND PRINTER - 63331869759897600 LPM

DATA BAND PRINTER - 126663739519795200 LPM

DATA BAND PRINTER - 253327479039590400 LPM

DATA BAND PRINTER - 506654958079180800 LPM

DATA BAND PRINTER - 1013309916158361600 LPM

DATA BAND PRINTER - 2026619832316723200 LPM

DATA BAND PRINTER - 4053239664633446400 LPM

DATA BAND PRINTER - 8106479329266892800 LPM

DATA BAND PRINTER - 16212958658533785600 LPM

DATA BAND PRINTER - 32425917317067571200 LPM

DATA BAND PRINTER - 64851834634135142400 LPM

DATA BAND PRINTER - 129703669268270284800 LPM

DATA BAND PRINTER - 259407338536540569600 LPM

DATA BAND PRINTER - 518814677073081139200 LPM

DATA BAND PRINTER - 1037629354146162278400 LPM

DATA BAND PRINTER - 2075258708292324556800 LPM

DATA BAND PRINTER - 4150517416584649113600 LPM

DATA BAND PRINTER - 8301034833169298227200 LPM

DATA BAND PRINTER - 16602069666338596454400 LPM

DATA BAND PRINTER - 33204139332677192908800 LPM

DATA BAND PRINTER - 66408278665354385817600 LPM

DATA BAND PRINTER - 132816557330708771635200 LPM

DATA BAND PRINTER - 265633114661417543270400 LPM

DATA BAND PRINTER - 531266229322835086540800 LPM

DATA BAND PRINTER - 1062532458645670173081600 LPM

DATA BAND PRINTER - 2125064917291340346163200 LPM

DATA BAND PRINTER - 4250129834582680692326400 LPM

DATA BAND PRINTER - 8500259669165361384652800 LPM

DATA BAND PRINTER - 17000519338330722769305600 LPM

DATA BAND PRINTER - 34001038676661445538611200 LPM

DATA BAND PRINTER - 68002077353322891077222400 LPM

DATA BAND PRINTER - 136004154706645782154444800 LPM

DATA BAND PRINTER - 272008309413291564308889600 LPM

DATA BAND PRINTER - 544016618826583128617779200 LPM

DATA BAND PRINTER - 1088033237653166257235558400 LPM

DATA BAND PRINTER - 2176066475306332514471116800 LPM

DATA BAND PRINTER - 4352132950612665028942233600 LPM

DATA BAND PRINTER - 8704265901225330057884467200 LPM

DATA BAND PRINTER - 17408531802450660115768934400 LPM

DATA BAND PRINTER - 34817063604901320231537868800 LPM

DATA BAND PRINTER - 69634127209802640463075737600 LPM

DATA BAND PRINTER - 139268254419605280926151475200 LPM

DATA BAND PRINTER - 278536508839210561852302950400 LPM

DATA BAND PRINTER - 557073017678421123704605900800 LPM

DATA BAND PRINTER - 1114146035356842247409211801600 LPM

DATA BAND PRINTER - 2228292070713684494818423603200 LPM

DATA BAND PRINTER - 4456584141427368989636847206400 LPM

DATA BAND PRINTER - 8913168282854737979273694412800 LPM

DATA BAND PRINTER - 17826336565709475958547388825600 LPM

DATA BAND PRINTER - 35652673131418951917094777651200 LPM

DATA BAND PRINTER - 71305346262837903834189555302400 LPM

DATA BAND PRINTER - 142610692525675807668379110604800 LPM

DATA BAND PRINTER - 285221385051351615336758221209600 LPM

DATA BAND PRINTER - 570442770102703230673516442419200 LPM

DATA BAND PRINTER - 1140885540205406461347032884838400 LPM

DATA BAND PRINTER - 2281771080410812922694065769676800 LPM

DATA BAND PRINTER - 4563542160821625845388131539353600 LPM

DATA BAND PRINTER - 9127084321643251690776263078707200 LPM

DATA BAND PRINTER - 18254168643286503381552526157414400 LPM

DATA BAND PRINTER - 36508337286573006763105052314828800 LPM

DATA BAND PRINTER - 73016674573146013526210104629657600 LPM

DATA BAND PRINTER - 146033349146292027052420209259315200 L

EUROPE'S LEADER
IN TELEPRINTERS,
VIDEO TERMINALS, PAPER
TAPE PUNCHES AND
DATA PREPARATION
EQUIPMENT.



Philips' software aids for US early 1978

DATA entry and preprocessing software already being sold on the Continent by Philips will be made available in the UK and the US early next year through its original developer, Four Phase Systems.

The software adds capabilities to Four Phase Systems' IV/70 data entry system, both in its local processing and mainframe communications modes.

New features include sequential access to index sequential files, increased flexibility in local printing and spooling of print files, extension of the IV/70 programming language to include all common arithmetic functions, and the ability to execute batch functions concurrently from more than one terminal.

The IV/70 is sold by Philips in Europe as the X1150 series, and the software is known there as Data X1150 Version 4.

Setback for Fujitsu

THE big breakthrough sought by Fujitsu in the Australian market may be a little delayed. The company was thought to be well ahead of the field for the prestigious Commonwealth Bureau of Census and Statistics contract with a large-scale M180 mainframe to replace its CDC 6800.

But Canberra reports that the CBCS is rethinking its whole strategy and may decide to put out another tender on the basis of several smaller systems. Fujitsu is likely to remain in the bidding.

ROYTRON™ plug-compatible punch

Desktop punch with serial asynchronous RS-232C compatible interface. Designed to utilize ASCII defined control codes and operate with a terminal device on the same serial data lines. Punch accepts data at all standard baud rates up to 800 baud continuous or 4800 baud batched, utilizing a 32 character buffer.

Two modes of operation are provided: Auto Mode—Simulates Model ASR 33 Teletype punch using ASCII defined data codes (DC2 and DC4) to activate/deactivate the punch; Manual Mode—Code transparent mode. Panel switches control activation/deactivation of punch and associated terminal device.

MODEL 1060-AS
High speed compact with self contained electronics and power supply. Complete in attractive, noise dampening housing.

SWEDA INTERNATIONAL, INC.

1000 Avenue of the Americas, New York, N.Y. 10020-1001
Telex: 250000 SWEDA
Cable: SWEDA
Phone: (212) 691-1000

COMPUTER WEEKLY INTERNATIONAL

Taking the heat out of the ops room

ALTHOUGH not confined to heat transfer in computers, much of the discussion at the recent National Science Foundation-sponsored research workshop in Atlanta, Georgia on directions of heat transfer in electronic equipment centred on computer applications.

Of the 33 who took part in three days of presentations and discussion, nearly half were from computer manufacturers — all from IBM alone.

Not surprisingly, the IBM "air conditioning within frame" concept was described as applying the direction in which electronic circuit board cooling is moving.

Here, the primary heat removal medium that passes over the components themselves is air, but a flat compact air-to-water heat exchanger is interposed in the air stream between each row of boards so that all receive cooling air at the same initial temperature.

Despite the emergence of high duty cooling systems using novolacs such as spray cooling, integral heat pipes and inert organic liquids, air was considered as remaining the primary coolant for 85% of computer applications.

Several ways in which more effective air cooling has been obtained included splitting the circuit board at its high thermally conducting core and passing air through the duct formed; clamping both board edges directly to water-cooled flat-plates; using an alumina or better, a beryllia heat exchanger attached directly to the base ceramic of LSI wafers.

However, with the use of air are associated problems of noise and effective air moving. All coolant flows, whether air or water, give rise to fouling problems; also, with all systems, the problem of finding accurate mathematical models than resemble. So do the problems of determining accurate values of contact thermal resistance and bulk material thermal conductivity.

Recommendations on areas for further research work included: investigation of the dependence, if any, of junction-to-base thermal resistance on the external heat removal mode; development of an air moving device delivering 25 to 30 litres per second at 60-80 mm water gauge, driven at 4,000 revolutions per minute by a 150 watt motor; aspects, such as fouling and heat transfer augmentation, of the final heat exchanger; optimisation and systematisation of existing air cooling technology at component level; flow characteristics and/or boiling characteristics at component level in liquid-filled sealed modules; cataloguing and describing available programs.

The proceedings are to be published in the spring and will be available from Dr Win Aung, National Science Foundation, 1,800 G Street, Washington, DC20550, USA.

IBM price cuts threat to Japanese expansion

AN American report on the Japanese computer industry following the launch of the IBM 3030 series questions whether the ambitious goals set for the industry by the Ministry of International Trade and Industry can now be met.

The report, by Mort Shepetin, of New York stockbrokers Dean Whittier and Co., says that the 3033 announcement was a shock to the Japanese. In that their programme was geared to matching the advanced new hardware expected in IBM's abandoned FS project.

Instead, the 3033 included no radical new hardware; it concentrated on improving the efficiency and extending the system software, an area in which the Japanese are weakest. Shepetin also says IBM's aggressive pricing faced the Japanese with a major headache, since their computer operations are already only marginally profitable.

Shepetin expects that IBM's price cutting policy for all 370 equipment sold in Japan will hit Japanese manufacturers' share of their home market. At present this is running at 57%, the highest it has ever been.

Government orders usually go

to Japanese firms but Shepetin believes that any loss of part of the private sector market will make it difficult for them to expand their drive into foreign markets.

He says that MITI is disappointed in the results of the pairings of Fujitsu and Hitachi, NEC and Toshiba and Mitsubishi and Oki, which was imposed on these groups by the government. Fujitsu and

Hitachi in particular are still competing head-to-head in the private sector.

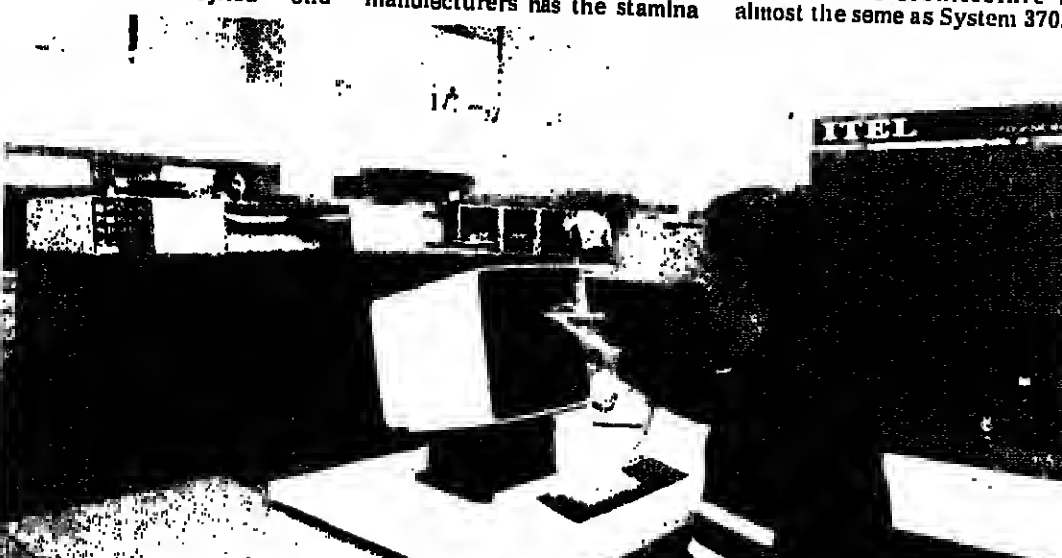
Equally they compete internationally, Fujitsu through Amdeh and Hitachi through ITEL.

The Japanese government is therefore now considering removing all guidance and leaving market forces to decide which one or two of the six manufacturers has the stamina

to survive, says Shepetin.

He also believes that the Japanese objective of exporting 15% of output by the mid-1980s is now not on and that 1990 is the soonest it could be achieved.

The Japanese manufacturers are making brave noises about the 3030 series machines, reports the Japan Economic Journal. They are playing up the fact that the machine architecture is almost the same as System 370.



ICL replaces IBM system in Montreal

A CANADIAN local authority has opted for an ICL 2903 to replace its IBM system 3/10 rather than a comparable IBM system.

The authority, Westmount, a suburb of Montreal, received a bid from IBM in the form of a System 3/12. This was withdrawn and replaced by a System-34.

The authority opted for the ICL 2903 because of "its sophistication of systems design, its facility for enhancement, high storage capacity and the data communications and direct data entry features."

The machine will run payroll, taxation, electricity billing, stock control and general accounting systems. In addition, it will be linked to public cashiers' counters and rates offices, via video terminals, for customer queries.

Some 160 RPG II and 50 Direct Data Entry programs were converted to run on the new system in two months with the

The first IBM compatible ITEL Advanced System to go live in Europe (pictured here) has been running since September 14 at Telys, the service bureau subsidiary of the French banking organization, Societe Generale.

Telys chose the AS/5 as a less expensive but equally powerful alternative to an IBM 370/158. It shares the Telys computer suite with two older IBM systems, an IBM 370/145 and a 370/155, and handles telecommunications for Telys customers all over France.

Meanwhile, ITEL in the US has set up a centre to develop new products, including bigger IBM compatible processors. The centre is in Palo Alto in the "Silicon Valley" area just south of San Francisco where ITEL has its headquarters.

The biggest ITEL computer at the moment is the AS/6. This is

built in Japan for ITEL by Hitachi and offered as a more powerful alternative to the 3032 (CW, October 13).

According to ITEL, the other new IBM machine, the 3031, still works out about 20% more expensive than the AS/6, even though it is much cheaper replacement for the 370/158. Next year AS/8 users will be able to field upgrade their machines to the AS/8 7031 which will have the 3031 hardware features not found on the 370/158, including a 32K byte cache buffer.

ITEL has installed 34 AS systems to date worldwide, including three in Europe, and plans to install 200 machines in 1978, including 80 in Europe. ITEL expects ten of these to be AS/6s and the rest to be AS/5s and AS/6s. The AS/4 is a more powerful alternative to the 370/145.

Videodata cable system has range of several miles

A WIDE-BAND coaxial cable data distribution system with spectrum of data, voice and video attachments is being marketed exclusively in Europe.

Designed primarily for in-plant use, the cable system has a range of several miles, costs about £1 a foot with ancillary interfaces and control modules, and supports frequency and time division multiplexing either separately or both modes in the cable.

Designed primarily for in-plant use, the cable system has a range of several miles, costs about £1 a foot with ancillary interfaces and control modules, and supports frequency and time division multiplexing either separately or both modes in the cable.

Designed primarily for in-plant use, the cable system has a range of several miles, costs about £1 a foot with ancillary interfaces and control modules, and supports frequency and time division multiplexing either separately or both modes in the cable.

PT7
The other
terminal for
IBM and ICL
mainframes
FERRANTI

Green light for Svenska Data

THE Swedish government has made "substantial concessions" in a bid to persuade Stansaab to join Datasab in its proposed national DP company, Svenska Data.

Assuming that a Bill establishing the Swedish parliament on October 28 receives the Royal Assent, the new company will come into being on January 1, 1978.

It will be based in Stockholm close to Stansaab's premises and the managing director will be Gunnar Wedell, the present head of Stansaab.

The Saab-Scania process control division — based in Jönköping and employing 120 people — and the computer system unit of the aviation division based in Göteborg will not be included.

The two proposed elements of Svenska Data, Stansaab and Datasab, will be of comparable size. Datasab has about 140 employees in Sweden and Stansaab about 1,200.

The two will operate separate divisions and the Datasab division, based in Jönköping, is to be headed by Harald Schröder, presently head of aircraft manufacturing at Saab-Scania.

"The internal structures of the new company have not yet been decided," Wedell told Computer Weekly.

"The merger will give both Stansaab and Datasab additional resources in terms of both capital and personnel. Research and development and general experience of the new company will be much stronger with both teams working together."

Svenska Data will be owned equally by Saab-Scania and the Swedish government. It will take in all the foreign Datasab subsidiaries apart from Datasab Systems Inc in New York, which will remain a Saab-Scania company. A US partner is being sought for Datasab Systems.

The capital of Svenska Data will be SKr 880 million (£88 million). In addition Saab-Scania will subscribe new capital totalling SKr 300 million (£34 million) up to 1981 and loans to a maximum of SKr 70 million (£70 million) will be guaranteed.

Redifon wins Brno orders

CONTRACTS worth £200,000 for Redifon key-to-disc systems were picked up in Czechoslovakia during September and October by Redifon Computers. There were 16 in all and most were signed by Brno Felt.

Part from the 22K systems (CW, October 13) Czech organizations in contracts included Savings Bank and State Insurance both already have Redifon from the Ministry of

LONDON		MANCHESTER		BIRMINGHAM		GLASGOW		BRISTOL		LONDON		MICHAEL WHITE	
Derek Blakemore		Owen Kelly		Alan Easton		Owen Kelly		Alan Easton		Steven Riddings		Classified Advertisement Manager	
01-261 8454		061-872 4211		021-356 4638		061-872 4211		021-356 4836		01-261 8174		01-261 8028/6658	

HOLLAND ANALYST/PROGRAMMERS £10,000 plus

Due to the development of a large new system one of our clients requires a number of Analyst/Programmers. If you have 2/3 years' experience in Cobol and an Online background preferable on IBM equipment we're interested.

The company is an international subscription service based in Lisse near the coast of Holland, and just 26 minutes from Amsterdam.

The system is currently running on a 370/135 using DOS/SHADOW 11/IDMS, but it will be upgraded later this year to a 370/138 under OS with 1 Megabyte. If you have the required experience and feel that a move to this English speaking installation in Holland would be of interest please send your curriculum vitae to:



**S. Mance
RENDECK NEDERLAND B.V.
A. J. ERNSTRAAT 157
AMSTERDAM
HOLLAND
or Telephone 010 31 20 481 215**

Systems Performance Analyst Wiltshire £6000-£7000

The ICL Support Team supporting a large and expanding IBM 2880 installation in Wiltshire require an experienced Systems Performance Analyst to collaborate with the customer on a wide range of system tuning and sizing activities. The main duties will include:

- tuning systems offering mixed local remote batch, MAC and TP services
- building performance measurement tools
- sizing future workloads
- use of analytic and simulation system models.

We are looking for a person able to see work through in these areas from inception to completion and if necessary to direct ad hoc study teams to this end. You should have at least 2 years' experience in sizing and performance analysis, close familiarity with monitoring and modelling techniques, and an in-depth knowledge of 2800 hardware and software architecture.

Relocation expenses will be given where appropriate.

For further details please contact Roger Tenny at ICL, Bureau West, Horton Road, Devizes, Wiltshire, SN10 2JB. Tel: (0380) 4921. Please quote ref. CW1572.

International Computers

think computers - think ICL

IBM VACANCIES

S/OP	148 DOS/VS POWER 2 shift, City	C4750	Ref. 213
S/OP	138 DOS/VS POWER 2 shift, City	C4800+	Ref. 218
S/OP	138 DOS/VS POWER 2 shift, S.E. Ldn.	C4100	Ref. 212
OP	138 DOS/VS POWER 2 shift, Middx.	C4100	Ref. 212
OP	138 DOS/VS POWER 2 shift, BIRMINGHAM	C4100	Ref. 212
OP	145 OVERSEAS 2 shift, N. Ldn.	C4230	Ref. 219
PROG	50 DOS/VS POWER 2 shift, Middx.	C4230	Ref. 219
ASST. DESIG.	50 DOS/VS POWER 2 shift, Middx.	C4230	Ref. 219
ASST. DESIG.	50 DOS/VS POWER 2 shift, Middx.	C4230	Ref. 219
S/OP	1937 GUS 2 shift, Middx.	C4000	Ref. 224
OP	SVR 1932 GUS 2 shift, Middx.	C4000	Ref. 224
ANALYST	1932 GUS 2 shift, Middx.	C4000	Ref. 224

2 yrs exp. S.W. Ldn (C4000) Ref. 222
Tel: 01-83 8201/2 or write to: 47 Essex Street, London, WC2R 3EP

X-Calibur
COMPUTER SERVICES

THE UNIVERSITY OF SUSSEX PROGRAMMER (Male/Female)

Required for the on-line development of data processing systems for the Administration. Experience of PL/I is necessary and training will be given in PL/I, TAB and GEORGE 3 if required.

The successful applicant will work closely with the department in planning and developing systems. The University computer which is situated about three miles from the sea.

Salary to £4,800 p.a. with four weeks holiday plus an additional week at both Christmas and Easter.

Applications giving full details of experience and names of referees should be sent to the Staff Relations and Recruitment Officer, Sussex House, University of Sussex, Falmer, Brighton BN1 9QJ.

Knight Contracts

IBM Programmers
with OS/CL experience
COBOL for MANCHESTER, LONDON and EUROPE
PL1 for LONDON and GENEVA
BAL for LONDON
FORTRAN for UK and EUROPE
(* French language useful)
Pang our consultants RICHARD YALUZYNSKI or SUZY GILLAH to register your availability or to make an appointment on 01-491 4706.

Operators
It's time your earnings kept pace with your experience. As long as you've been operating for 2½ years or more, we can find you the contract to boost your earnings and your experience. Take a look at our current requirements. You may find just what you've been looking for.
ICL GILTOPS
IBM OSOPS
Honeywell GCOS OSOPS
VMS OPS
For further details or advice on these and other contracts still in the pipeline call Sue Smyth, June Mogg or Jane Asbury on 01-491 4706.

Knight Recruitment

Systems Engineers (Trainee Analysts)
Up to £6,000 pa - City
A tempting career move for an experienced programmer, educated to degree standard with plenty of ambition and drive. Our client is one of the major multi-national manufacturers and currently has vacancies available within its support group, responsible for medium to large range machines. Essential personal attributes are enthusiasm and ability to work effectively with the users (including technical people), as well as logic.
Compensation and training will be given and there will also be a certain amount of travel involved for which a current driving licence is required.
Future prospects offer you the chance to move into DP Management, Sales or an overseas appointment.
Ref. JP/0062 London

Operators
Telecommunications - North London
£3,000 plus 30% Shift Allowance
Telecommunications Company with an excellent reputation as an employer needs two bright young operators with at least 12 months' Honeywell experience (60/60/6000) - preferably with knowledge of GCOS - to work a three-shift system in a go-ahead DP department. Good benefits and excellent career prospects within this large international group.
Ref. AM/0059 London

Paris, North Africa, The World
All yours as a Project Leader or Analyst
Programmer with £10,000+
After training in Paris you'll be off to North Africa to advise clients of a major international computer manufacturer. After that you could move anywhere in the world. A Project Leader and also Analyst Programmers are needed with at least two years' COBOL experience and preferably some ALGOL. You must be French speaking and ideally have a background in banking. Self-reliance, initiative and a willingness to live abroad are key requirements. Ref. JP/0027 London

Interactive Systems and database
Up to £7,000 for Analyst/Programmers and Analysts in West London
International petro-chemical construction giant needs able, ambitious men and women, ideally technical graduates, with experience of high-level languages on mainframes. Applications are many and varied, hardware includes IBM, Univac and minis, prospects include overseas travel.
Ref. JP/0012 London

All vacancies are open to both male and female applicants.

Knight

01-4914706 24-hour answer phone.
Knight Computer Services Limited, 140 Canal Road, London W1Y 4NL.
021-772 8331 Midlands Recruitment.
Knight Computer Services Limited, Woodlands Road, Birmingham B8 3BD.

Knight Computer Services Limited

Staff Services Division of BOC Datasolve Group and a member of Computing Services Association.

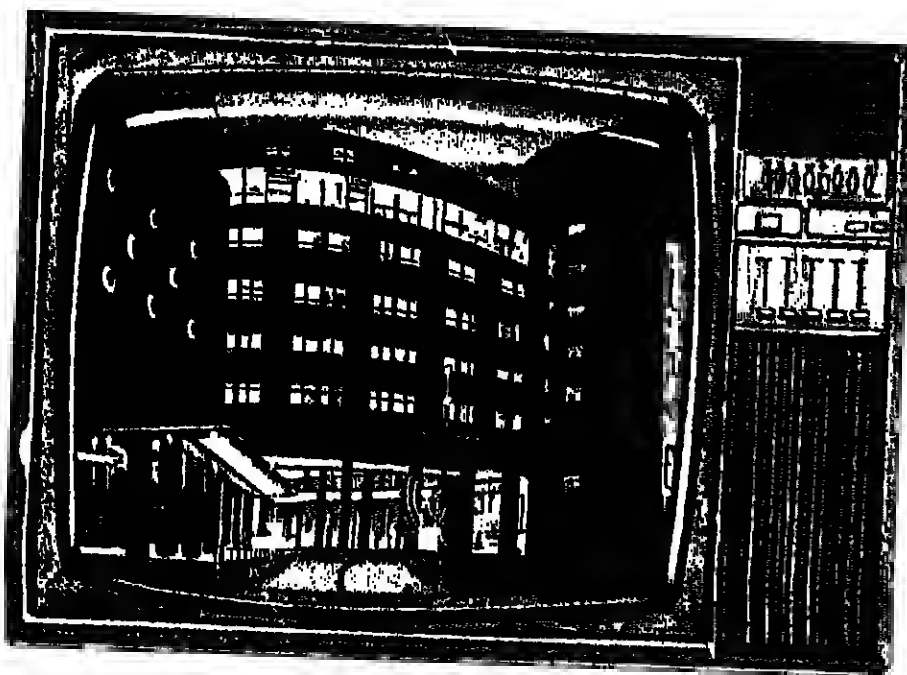
For a better tomorrow, act today. To speed up your application or to get information on opportunities in the future, send us the coupon.

Name _____
Address _____
Tel (home) _____
Tel (work) _____

Area preferred _____
Number of years experience in _____
Operating _____
Analyst _____
Salary required _____
Position required _____
Contract type _____

SYSTEMS ANALYSTS & PROGRAMMERS

**Come to an Open Evening
at Television Centre
on Tuesday, 15th November
between 6pm-7pm.**



The BBC would like to invite business orientated Systems Analysts, and also Programmers, to an Open Evening on Tuesday, 15th November between 6pm-7pm. Meet us at Television Centre, Wood Lane, Shepherd's Bush (opposite White City Central Line Station).

The purpose of the visit is to explain the role of computers in Broadcasting today, and includes a brief tour of Television Centre. Our application areas include aids to Production and Transmission Planning, Management Information Systems, and Financial and Stock Control Systems. We think you'll find the visit extremely interesting.

particularly if you're a Systems Analyst concerned about solving user problems, with 3/5 years experience; or a Programmer with 2/3 years experience with ICL equipment and writing COBOL programs in a business environment.

And we hope you'll find our salary scales equally interesting: Analysts (£5050/£6000); Analyst Programmers (£4575/£5400); Programmers (£3625/£4950).

If you can't come along, write or telephone, Appointments Dept., BBC, London W1A 1AA, quoting reference no. 77.G.1572.CW.. Tel. 01-580 4468 Ext. 2292

BBC

Senior Programmer/Analyst

to join our Computer Department which provides a service to all refinery administration and technical departments.

Applicants should preferably have an education to GCE 'A' level with at least 5 years' programming and systems analysis experience. Languages used are COBOL, FORTRAN and PLAN.

Our equipment consists of an ICL 2904 configuration plus a DCT 132 terminal linked to computer facilities at other BP centres in the UK.

Kent Refinery is part of the BP Group and this position could lead to further career development opportunities within BP. Salaries and benefits are competitive and there is a non-contributory pension scheme. Write or telephone for an application form, quoting ref. CW1, to:

M. J. Conway, Personnel Officer, BP Oil Kent Refinery Limited, Isle of Grain, Rochester, Kent, ME3 0AG. Tel: Medway 272044, ext. 555.

BP BP Oil

PERTH AND KINROSS DISTRICT COUNCIL

Systems Analyst/Programmer

The District Council are considering the appointment of a Systems Analyst/Programmer in the Finance Department in Perth.

Salary scale AP III £3474-£3825 (plus Phase 1 and 2 supplements of £501-£519). Local government hours and conditions of service will apply. Housing needs will be considered in appropriate cases.

Application forms and further particulars are obtainable from the Chief Executive, Council Chambers, 3 High Street, Perth. Closing date for receipt of completed applications is Friday, 26th November 1977.

SOFTWARE TECH. INSTRUCTOR

N.W. LONDON

A computer educational instructor presenting a Degree or equivalent, with a working knowledge of RPLP in a 2nd application area, with a formal capability level is required to identify, develop and conduct training for large CA.

SENIOR SYSTEMS ANALYST

N.R. EDINBURGH

A Systems Analyst with a minimum of 2 years experience in a large go ahead Company, which is expanding fast. Duties include business problem analysis, logical system design and implementation of batch and on-line.

Please phone for an Application Form

DEPUTY TEAM LEADER

W. BUREY

A Programmer with a level standard maths and a proven leadership ability as Deputy Team Leader. Knowledge of ASSEMBLY, FORTRAN with scientific programming exp and PDP 8.

ANALYST/PROGRAMMER

UXBRIDGE

A person ideally with one completed project and with a knowledge of COBOL programming is required to guide 1-2 programmers and design and implement programs as dictated by overall systems design.

AMES PERSONNEL
TELEPHONE: 01-767 0811

Systems Manager

c. £7,000 p.a.

Grundig International are one of the leading manufacturers of quality electrical goods. We are poised to undertake a long-term project to streamline our conventional computer related systems to bring about a coherent and flexible organisation to meet future market demands. Recently, an IBM Systems 3, Model 15 has been installed.

To lead these changes we are looking for a systems design specialist with a professional approach to organisational change who will report to the Financial Director. Success will be measured in terms of precise planning control and implementation, utilising outside software facilities and an understanding of the realities of maximising the contribution of systems within a medium sized company.

An assistant is also required to provide detailed programming support to these activities. The positions carry excellent remuneration packages which will reflect the on-going contribution of the successful applicants.

To discuss your career aspirations, please telephone The Personnel Manager, Grundig International Limited, Newlands Park, Sydenham, London, S.E.26. Tel: 01-859 2468.

GRUNDIG

Junior DOS/VS Systems Programmer

Morgan Guaranty, one of the world's leading banks is seeking a Junior Systems Programmer to work in one of its IBM 370 computers in its new offices in Stratford.

This position will involve working in the Computer Technical Support Group and being involved in the day to day job in all aspects of systems programming.

The Computer department is currently involved in a major automation exercise with the resulting systems being batch and on-line, being implemented in phases over the next few years.

The successful applicant will have at least two years programming experience on IBM 360/370 machines, one or more years Assembler Language programming in OS or DOS/VS. He/she will be involved in the technical support of all of the bank's systems currently being developed and using CICS/VS for its on-line systems.

The bank pays particular attention to career development and provides both in-house and external training opportunities.

A competitive salary will be paid, reflecting the level of the position and in addition there are attractive benefits which include annual bonus, low cost mortgage, and a non-contributory pension scheme.

Please write to: Mr. R. E. Bingham, Personnel Manager, Morgan Guaranty Trust Company of New York, 33 Lombard Street, London, EC3P 3BB.

Morgan Guaranty Trust Company

A NATIONAL BANK
in THE MIDDLE EAST

High rewards + Career development

OUR CLIENT is a major bank with many international connections, which undertakes highly diverse activities within the banking field. They have investigated the need for computerisation in a very thorough and professional way, and will take phased delivery of two NCR Criterion mainframes during the next 12 months, plus further systems later. The bank now requires high-calibre professionals to fill the key positions described below.

ENVIRONMENT. The climate is hot, but air conditioning is standard. Social facilities are limited but developing rapidly within an economy experiencing an enormous rate of expansion. There is ample scope for adaptable individuals to enjoy an active social life.

ACCOMMODATION. Fully furnished modern flats with free utilities are provided for employees and their families.

CHILDREN. Generous schooling allowances are given, but local education beyond the age of 11 years is problematical. Except for the most senior position an applicant with more than 2 children is likely to be at a disadvantage, unless he is prepared to leave his family in the U.K. Return holiday fares are paid for the whole family. Should his family remain in the U.K., the cost of additional periodic visits to them will be paid.

MEDICAL TREATMENT. Medical facilities are good and there is free private treatment for the employee and generous provision for his family.

CONTRACT OR PERMANENT. Recruits may take contracts or join as permanent employees.

TRAINING. Appropriate training will be provided.

RESPONSIBILITIES: All computer facilities and related activities.

CANDIDATE PROFILE:

- 1) Will almost certainly have good knowledge of banking systems.
- 2) Must have good experience of computer systems development and OP management within a sizeable mainframe installation.
- 3) Will be capable of achieving results through people.
- 4) Age probably 30 to 45.

CW/917/M

D.P. MANAGER
to £20,000 p.a. TAX-FREE

+ FURNISHED MODERN FLAT + CAR

+ OTHER MAJOR BENEFITS

SENIOR ANALYSTS
to £12,500 p.a. TAX-FREE

+ FURNISHED MODERN FLAT + CAR or assistance

+ OTHER MAJOR BENEFITS

RESPONSIBILITIES: All aspects of systems investigation; analysis, design and implementation.

CANDIDATE PROFILE:

- 1) Minimum of 6 years' O.P. experience, including programming and all aspects of systems development and implementation using mainframe computers.
- 2) Knowledge of banking systems.
- 3) Age probably 24 to 40.

CW/917/A

OPERATIONS MANAGERS
to £11,250 p.a. TAX-FREE

+ FURNISHED MODERN FLAT + CAR or assistance

+ OTHER MAJOR BENEFITS

RESPONSIBILITIES: All aspects of a mainframe computer and its operation.

CANDIDATE PROFILE:

- 1) At least 6 years' experience of computer operations within mainframe installations, ideally including an NCR 8550 or 8250.
- 2) At least 2 years as an Operations Manager.
- 3) Age probably 23 to 36.

CW/917/O

SENIOR PROGRAMMER
to £11,250 p.a. TAX-FREE

+ FURNISHED MODERN FLAT + MAJOR BENEFITS

RESPONSIBILITIES: Leading programming team plus participating in programming work.

CANDIDATE PROFILE:

- 1) At least 4 years' programming experience including good COBOL. Experience of NEAT/3 would be an advantage.
- 2) Experience of leading a team or demonstrable ability to do so.
- 3) Age probably 23 to 38.

CW/917/S

COBOL PROGRAMMERS
to £10,000 p.a. TAX-FREE

+ FURNISHED MODERN FLAT + MAJOR BENEFITS

RESPONSIBILITIES: All aspects of the writing and testing of programs.

CANDIDATE PROFILE:

- 1) At least 3 years' programming experience including good COBOL. Experience of NEAT/3 would be an advantage.
- 2) Age probably 20-30.

CW/917/R

* THE POSITIONS DESCRIBED ABOVE OFFER THE OPPORTUNITY NOT ONLY TO MAKE CONSIDERABLE SAVINGS BUT ALSO TO ENJOY CAREER DEVELOPMENT.

* PLEASE TELEPHONE OR SEND A C.V. WITHOUT DELAY AS THE TIMESCALE OF THE RECRUITMENT ASSIGNMENT IS VERY SHORT.

DPSC

DPSC Group Limited, Crown House, Morden, Surrey, SM4 5EU. Telephone: 01-540 8311

International Recruitment and Search Consultants to the Computer Industry

Apply to DPSC

AUSTRALIA

IF YOU HAVE THOUGHT OF MIGRATING TO AUSTRALIA, CONSIDER THE FOLLOWING.

CONTROL DATA AUSTRALIA has a solid record of achievement in the marketing of systems in the areas of education, scientific, waging, government and manufacturing. In recent years, the Company has consistently achieved or exceeded all of its established sales targets. In addition, Control Data has its own Australian manufacturing facility, operates one of the country's largest and most comprehensive service bureaux, and is a leader in the marketing of advanced education and scientific systems.

CONTROL DATA AUSTRALIA requires people with expertise to work in the above mentioned areas. Vacancies exist in Melbourne and Sydney, and occasionally in Perth, Adelaide, Canberra and Brisbane. We do not intend recruiting in the United Kingdom in the near future but if you are thinking of migrating to Australia why not contact us for further information about our employment opportunities.

CONTROL DATA AUSTRALIA seeks experienced

- Commercial Analyst/Programmers (Cobol experience a must)
- On Line Real Time Network Programmers
- Pre Sales Analysts
- Systems Programmers
- Proven Systems and Bureau Salesmen
- Customer Engineers (CDC, IBM or ICL System 4 experience preferable)

CONTROL DATA AUSTRALIA offers successful applicants an excellent salary package which includes Company car or car allowance, superannuation, 4 weeks annual leave with a 17.5% leave loading, excellent working conditions and career opportunities.

If you are interested in applying for a position with CONTROL DATA AUSTRALIA please send your resume, including location preference in Australia, address and contact telephone number in U.K. to

Miles Sandra Beasley
Manager, Recruitment and Selection



CONTROL DATA AUSTRALIA PTY. LIMITED
598 St. Kilda Road, Melbourne, 3004. Telephone: (03) 51 0351.

CONTROL
DATA

404 3011

ANALYST/PROGRAMMERS

Crawley, Sussex. Up to £5000 p.a.

* Mallory Batteries manufacture and market the high performance 'Duracell' range of batteries throughout Europe.

* The growth in our European markets has resulted in an expansion of the data processing operations. Development of new and existing systems, on-line facilities and distributed processing is planned for the current five IBM System 3 machines and new hardware installed throughout Europe.

* Candidates should have at least two years' experience in either COBOL or RPG II and a thinking attitude to programming.

* These positions will provide ample opportunity for career development in a progressive company.

* Our conditions of employment are those you would expect from a multi-national organisation and we are prepared to assist towards re-location expenses where appropriate.

Please write, with full C.V. to:—
G. M. Smith, Personnel Manager, Crawley or telephone (CRAWLEY 26041) for an application form.

To discuss the job requirements in more detail please telephone 80 8 PHILLIPS in our Data Processing Department.

MALLORY BATTERIES LIMITED, Gatwick Road, Crawley, West Sussex RH10 2PA

MALLORY

DURACELL®

SENIOR PROGRAMMER/ANALYST

A vacancy exists in our Data Processing Department for an experienced Programmer to assist in the maintenance and development of commercial systems. The Company operates a Broughs B175.

Applicants should be at least 25 years of age, have 3 to 4 years' commercial data processing experience — preferably using RPG II and be of a mature personality enabling them to communicate with people at all levels.

The Company is highly successful in its field of operations which entails the manufacture and supply of Educational Stationery and Teaching Aids. An attractive salary is offered for the post and the Company operates a staff restaurant and Sports and Social Club.

Applications, stating age and experience to date should be addressed to:

General Manager
Phillips & Tacey Limited
North Way, Andover, Hants.
Tel. Andover 01171 (0284)

SYSTEMS PROGRAMMERS HONG KONG

Chartered On-Line Limited, Hong Kong's largest computer service organisation, requires additional specialists to meet the demands of its expanding business.

Immediate requirements are:

- (1) Univac 1106 Systems Programmer with at least 3 years' EXEC 8 experience.
- (2) Minicomputer Systems Programmer/Assembler. Programmer preferably with PDP 11 or Data general experience.

These appointments provide an attractive remuneration package, including travel and housing allowances. Maximum income tax is 15 per cent of salary. Write with full details by 24th November, to the Technical Manager, Chartered On-Line Ltd., Asian House, Hennessy Road, Hong Kong. Interviews in England early December.

INTERDATA

Further expansion of the European Software Development Group has created new opportunities.

Systems Support Programmer

Up to £5,000

A SYSTEMS SUPPORT PROGRAMMER is required to support Operating Systems, Systems Software and Utilities used by the group. Design and implementation of utilities for users and operations staff, liaison with users within the group and with Interdata personnel in the United States will form important components of the job. In addition the systems support programmer will act as Systems Software Librarian for the group.

Candidates will have 1-2 years' programming experience, preferably in assembler and should have experience of this type of work.

This appointment offers unlimited career potential to individuals with the necessary background, experience and qualities.

Salary will be commensurate with abilities and experience and will range up to £5000.

If you are interested, call or write to PAUL JARDINE.

INTERDATA LIMITED
227 Bath Road Slough SL1 4AX
Telephone Slough 34511

Computer Operator

Honeywell 62/40

Wiltshire

Salary £3,250

We are in the process of relocating our headquarters, including the computer installation, to pleasant surroundings in Wiltshire.

We are taking delivery of a new Honeywell 62/40 and have a vacancy for an operator with a minimum of two years experience on small to medium sized computers in a multi-programming environment.

The successful applicant will be given every opportunity to develop their career.

Benefits include single day shift working and generous relocation expenses in appropriate cases.

For an application form please write or telephone:



Alan Eggleton
Mears Bros Holdings Ltd.
154/158 Sydenham Road
London SE26 5LA
Tel: 01-778 7851

Assembler Programmers

Information systems customer support

London based

NCR offers rare opportunities for Programmers to step up the computer ladder, using their current Assembler experience.

These are get-up-and-go positions, taking you out of the rut and into the customer environment. You would guide their operating staff in the implementation of Computer Output Microfiche (COM) on NCR Record/Processors Series 110/115.

Our software packages support the most advanced business recorders in the world — another outstanding example of NCR's growing dominance in the computer field. Already, over 100 users in the U.K. with large up-to-date installations have adopted our COM systems. As our COM systems are used on all major manufacturers' equipment you will have the chance to broaden your equipment knowledge.

You can see why sound Assembler experience is essential — whether gained on either NCR or any other major manufacturer's equipment. Some positions will however not require IBM Assembler under OS or DOS, but good JCL knowledge.

Give us this and we'll give you a very attractive salary, full training and a worthwhile big Company bonus package. Plus regular career development into Assembler, Programmer and Systems Analyst roles.

It couldn't be a better time to join our multi-national activities, which are advancing rapidly. If you are a motivated Assembler, get the facts. Or write giving us details quoting J&P (CV) 10/77.

Geoff Hodder, Recruitment Officer, NCR Limited, 208 Mervyn Road, NW1 6LY. Tel: 723707.

NCR

Terminal Networks and Distributed Processing North Midlands Home Counties Consultants. Analysts. Programmers And Demonstrators Salaries £3,500 to £6,500

New development within the support group of this well respected marketing organisation have resulted in several genuine career openings being created. The earnings packages are generous and the structured career development plans makes promotion a real possibility — depending on YOUR efforts. Several new products have been recently introduced and you will be involved in either developing packages and/or implementing and supporting new sites. You will be taking part in a concerted team effort to establish a solid customer base and will be working in a fast moving, challenging environment.

Qualities required:

Demonstrators

You will have the ability to impart technical information to inexperienced personnel — either informally, or in "classroom" situations. You must have a flexible attitude and any experience of terminals or direct data entry devices, and/or product demonstrating will be of particular interest. All necessary training will be provided.

Analysts

You will be able to carry out pre-post sales support duties and represent the company's interests to its clients in addition to possessing the qualities mentioned above. You will have a programming background and have completed at least one systems project — any involvement in data communications or specialised applications such as retail/distribution, banking, insurance or engineering make you of particular interest to our client.

Programmers

You must be mobile, self disciplined and keen to succeed. You must have gained a minimum of 2 years' programming experience in COBOL, RPGII or ASSEMBLER. Any prior knowledge of terminals, key to disc or distributed processing systems will be most useful. Full product training will of course be provided on commencement.

Consultant

At present you will have control of a team of programmers and analysts, you should have had at least 5 years' experience of analysis and be capable of handling multi-project situations. You will have a flair for organising and motivating your staff and will have specialised knowledge of one or more of the applications areas mentioned above.

If you wish to benefit from the growth of this already established company, then telephone our Manchester office now, quoting reference: CW64-7M. Interviews can be conducted in either Manchester or London.

01-686 9693 (24 HOUR ANSWERPHONE) | 061 236 2419 FAULKNER HOUSE,
19, PARK STREET, CROYDON, CR9 1TN | FAULKNER STREET, MANCHESTER, M1 4YD

COMPUTER AND
PROFESSIONAL
PERSONNEL
CONSULTANTS



CAPP ASSOCIATES
LONDON AND MANCHESTER

Computing
Services
Association

SOUTH WEST THAMES REGIONAL HEALTH AUTHORITY

Ever felt that you would like to put your hard-earned professional skills to really satisfying use? Job satisfaction is not easy to find, but we believe that you will find it with The South West Thames Regional Health Authority. You will also find excellent salaries, with guaranteed annual increments, and job security; and the expanding role of computers within the Health Service ensures considerable potential for DP professionals. The Authority needs you to help provide

medical, financial and management information services to the 150 hospitals in a region looking after 3 million people. The purpose built computer centre, situated in London, SW17, houses a new ICL 1903T running under George 3, with MOP. The SWTRHA intends to remain at the forefront of technical development with OMR, microfiche, communications, database techniques and structured programming techniques currently under evaluation.

If you want a little more purpose in life and to enjoy your work in a modern, progressive environment, phone now for an informal discussion of the following opportunities.

SYSTEMS ANALYSTS

£4408-£5857

Required to join a small team of professionals tackling real problems.

The Authority's ambitious plans include the development of several large real-time and batch systems for a wide variety of applications including budgetary control, patient monitoring, remote data capture and the provision of management information to hospitals.

Successful candidates will enjoy a high level of user liaison as well as contact with other Health Authority Computer Centres nationally.

Analysts are closely involved with user training, incorporating the latest multi-media techniques including videos.

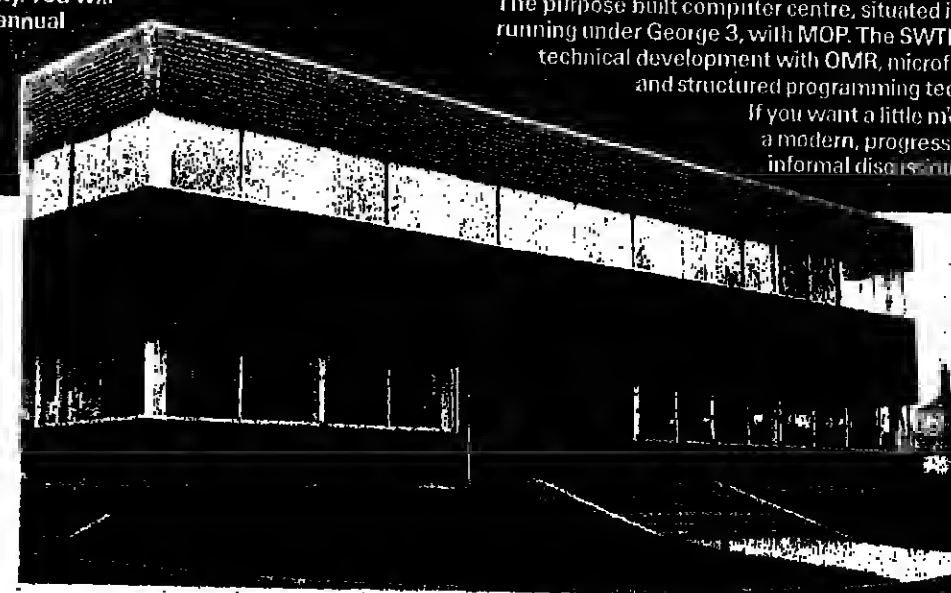
This is no back seat job! We are looking for enthusiastic, talented professionals who will lead, not just contribute.

INTERMEDIATE PROGRAMMERS £4408-£5218

Applications are invited from programmers with at least 3 years' experience together with a thorough knowledge of ICL 1900 COBOL (George 3 training will be given where necessary).

Successful candidates will enjoy some systems involvement and will be responsible for all aspects of development and testing.

They will also be expected to contribute to the design of files and assist in the supervision of more junior programmers.



COMPUTER OPERATORS SINGLE SHIFT £3000

The essential requirements for these excellent, ground-floor opportunities are an ICL 1900 background coupled with a sound knowledge of George 3.

The combination of small project teams, structured programming, on-line program development, closely controlled standards and quiet, pleasant, offices provides the ideal climate for high productivity and a quality of experience to be gained in few other establishments.

Telephone Mr. Las King, up to 8.00 p.m. each evening, or write, enclosing brief career details to: Modern Computer Services Limited, FREEPOST, London SW11 6BR. Telephone: 01-228 2283

MODEM

Consultants in Data Processing

Edmund Howard's Client Album

SENIOR PROGRAMMER

LONDON, SW1
£6000

A highly specialised consultancy is currently seeking an experienced senior programmer to assume total responsibility for the company's commercial programming activities.

The successful candidate should possess a sound knowledge of Cobol coupled with in-depth experience of the IBM DOS Operating System. An ability to deal with personnel at all levels is essential. Additional duties will include providing technical support to the operations team to ensure that objectives are met within the timescales laid down.

This is a key position for someone with the right qualities whose background combines both skill and professionalism. In keeping with the company's fine reputation for providing a good and efficient service.

For further details please quote CW 180.

REAL-TIME AVIONICS COMMUNICATION SYSTEMS

U.K. AND EUROPE

The Avionics Aerospace industry is one of the most progressive areas of Data Processing. New technological developments within the industry have created a need for specialist skills of a very high order. Computer professionals (both hardware and software) with experience of Mini real-time communication systems, coupled with a working knowledge of Assembler and/or Fortran will find the challenge of this competitive environment both refreshing and stimulating. Candidates should hold a degree or equivalent and be willing to assume total responsibility at either Programmer, Analyst/Programmer or Consultant level. The salaries for these positions, although negotiable, will reflect the experience and commitment of the individual.

For further details please quote CW 181.

SYSTEMS ANALYST

SURREY
SALARY c. £5500 p.a.

We are recruiting on behalf of a large independent public organisation who operate as financial, professional and commercial agent for overseas government and public authorities.

SYSTEMS ANALYST. A systems analyst is required for a team concerned with the design of a major new system for order processing and accounting. Candidates should preferably have at least 4 years' experience of programming and systems design including on-line systems and data base file structures. Knowledge of Honeywell IDS and TDS would be an advantage. Starting salary will be negotiable up to £5,500.

For further details please quote CW 182.

COMPUTER SCIENTISTS FOR BASIC SOFTWARE DEVELOPMENT WEST OF LONDON

Salary up to £6,500

Further expansion and development within our client's European Software Development Group has created opportunities for Computer Scientists to be involved in the design and implementation of compilers, T.P. monitors and data base systems. Candidates should possess systems software development experience which will probably have been gained with a Computer Manufacturer or software house.

These appointments offer unlimited career potential to individuals with the necessary background, experience and qualities. Senior candidates can expect to assume project leadership responsibility in the not too distant future. For further details please quote CW 183.

Edmund Howard & Partners Computer Personnel Consultants

5 Brighton Road, Surbiton, Surrey. Telephone 01-899-9183.
98 Grafton Street, Dublin. Telephone 776-756.

Holland

IBM Cobol Programmers Up to £9000 p.a.

This is an ideal opportunity for IBM COBOL programmers with a minimum of two years practical experience and good educational background to relocate to an attractive part of Holland.

Our client, a very large commercial group, based in The Hague is looking for young programmers who wish to further their career in an expanding environment. Attractive salaries will be offered to successful candidates and fringe benefits include four weeks holiday, non-contributory pension, company paid course, initial assistance with accommodation and special tax concessions.

Hardware used is an IBM 370/125 with 256K bytes (to be upgraded to 384K bytes). The operating system is DOS/VSE with SHADOW 11. Further expansion plans involve an IBM 370/138 and the utilisation of structured programming techniques.

New projects include working on systems for Equipment Planning and Control, Financial Administration, Project Control, Cost-Estimates etc. Other duties are maintenance of existing systems and installation of packages.

London interviews will be conducted by our Holland representatives during the week commencing November 21st 1977.

Change to Distributive Processing Systems Software Engineer c.£6000 West London

As technology has advanced, processing power and memory are not only to be found in mainframes, but also in terminals, intelligent terminals. The philosophy of Distributive Processing is now very much a reality and a fast growing market. A worldwide company requires a Systems Software Engineer to work in advising its network of distributors on the use of terminal processors and to solve the problems of distributive processing systems.

The company is looking for people with preferably a Computer Science degree and over two years experience at a basic level on several different machines.

The successful applicant will be given extensive training to achieve and maintain a high degree of familiarity with the product. He/she will then be involved in identifying and solving basic software and applications problems. This job will lead to Systems Project Manager and some overseas travel may be involved.

If you are attracted to the forefront of technological development ring me, Stelle Mitchell, and I will advise you.

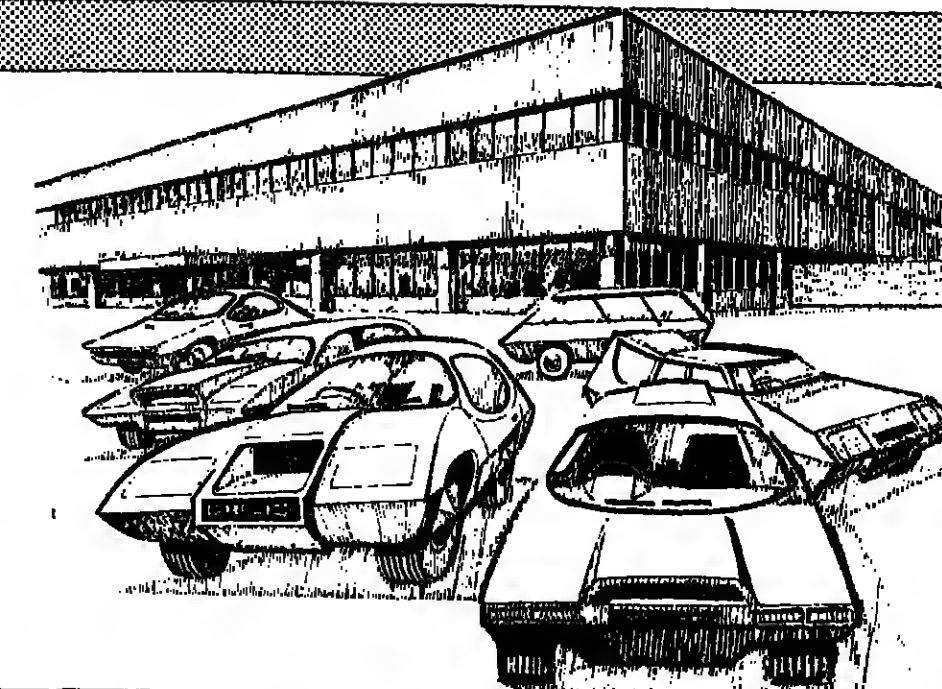
Kingston: 44 Wood Street, Kingston upon Thames, Surrey.
Telephone 01-549 3212 (24hrs) Telex 27950
Dublin: Canberra House, 24 Lower Leeson Street, Dublin 2.
Telephone 762170/762188/765692 Telex 30742
Amsterdam: Rivierstraat, Amsterdam 1010.
Telephone 461844 Telex 11336

Computing Services Association

TOMORROW'S WORLD

Our client is a U.S. based mini/midi computer manufacturer with an eye to the future. Their advanced technology makes them market leaders in their field — where they go, others follow. They have a substantial customer base in the manufacturing, industrial, scientific and technical sectors, and are now penetrating the commercial sector with equal success.

Their modern Headquarters in South Berkshire reflect their excellent company image.



SALES — NORTH AND SOUTH TERRITORIES

Base salaries circa £6,000 p.a. plus attractive incentive scheme with 80% of total earnings guaranteed, plus company car, plus profit sharing.

The company have vacancies for three sales people — two to establish new territories, which can be defined to suit the location of the successful candidates; based in the North, with support from a Manchester office.

The other to cover a Southern territory of a 50/70 mile radius of Central London.

We are looking for successful MINI computer sales people with a proven track record to join a highly professional sales team, with excellent technical and engineering support.

Alternatively, if you are a relatively young Systems Analyst, presently working within a large company environment and have ambitions to expand your horizons, this could be your opportunity.

SALES — U.K. KEY ACCOUNTS

Base salaries circa £6,000 p.a. plus attractive incentive scheme with 80% of total earnings guaranteed, plus company car, plus profit sharing.

Opportunities exist for two sales people to take responsibility for key named accounts in the U.K.

SALES SUPPORT ANALYSTS

Base salary £5,500 p.a.-£6,500 p.a. plus company car, plus profit sharing.

For these positions our clients require people with a sound knowledge of commercial computing and COBOL. You will have the opportunity to gain expertise in Data base Management Techniques, Distributed Systems and Operating Systems. Successful candidates would possibly be analysts who have progressed from a programming background, in either a mini or mainframe environment.

These Support Analysts will be available to offer technical support to both sales force, and the Company's extensive customer base.

These vacancies are at the Company's Headquarters near Wokingham.

STAFF ENGINEERS

Base salary £4,500 p.a.-£5,000 p.a. plus profit sharing.

Young Junior Programmers or University Graduates with an interest in sales are offered a 'once in a lifetime' opportunity to gain valuable training and experience. Initially you will be involved in demonstrating kit to customers, benchmarks, dealing with technical queries, and generally providing support internally to the sales force.

These vacancies are based in Manchester or the Company's Headquarters near Wokingham.

Within 6-12 months you will have the chance of joining a highly professional sales team.

The company offers above average conditions of employment, including profit sharing, non-contributory pension scheme, subsidised medical insurance, and relocation expenses.

Initial interviews to be held in London, Birmingham and Manchester.

If you are interested in working in tomorrow's world, and have, preferably, a Degree which has been applied to computing:

CONTACT: DALE HADLEY

On 021-236 3781

REF. NO. CW/11/6

SPECIALIST COMPUTER RECRUITMENT LTD

BIRMINGHAM 021-236 3781 FREEPOST
Freepost, Equity and Law House, 35-37 Great Charles Street, Queensway, Birmingham B5 2BR

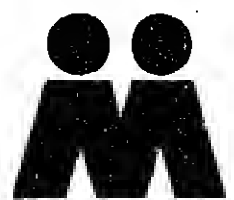
MANCHESTER 061-835 0676 FREEPOST
Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST
Freepost 6, 102, Blandford Street, London W1E 1JZ

SCR

Computing Services Association

021-236 3781



MOUNCEY & PARTNERS LIMITED

York House, Empire Way
Wembley, Middlesex HA9 0PA

These job descriptions are intended only as a brief outline of the general experience we require which will, preferably, have been on large mainframes in Financial, Commercial, Government or Manufacturing environments.

SENIOR CONSULTANTS

Major Project Management, Feasibility Studies, Systems investigations, Computer Audits, etc.

CONSULTANTS

Project Management responsibility, Systems Analysis, detailed design.

TECHNICAL CONSULTANTS

Technical team management experience, project responsibility, detailed system design.

ANALYST/PROGRAMMERS

Similar experience as below plus some detailed systems spec. writing, team/person management experience, etc.

SENIOR PROGRAMMERS

With experience of machines identified below and some experience or potential in team leading, program spec. writing, etc.

PROGRAMMERS

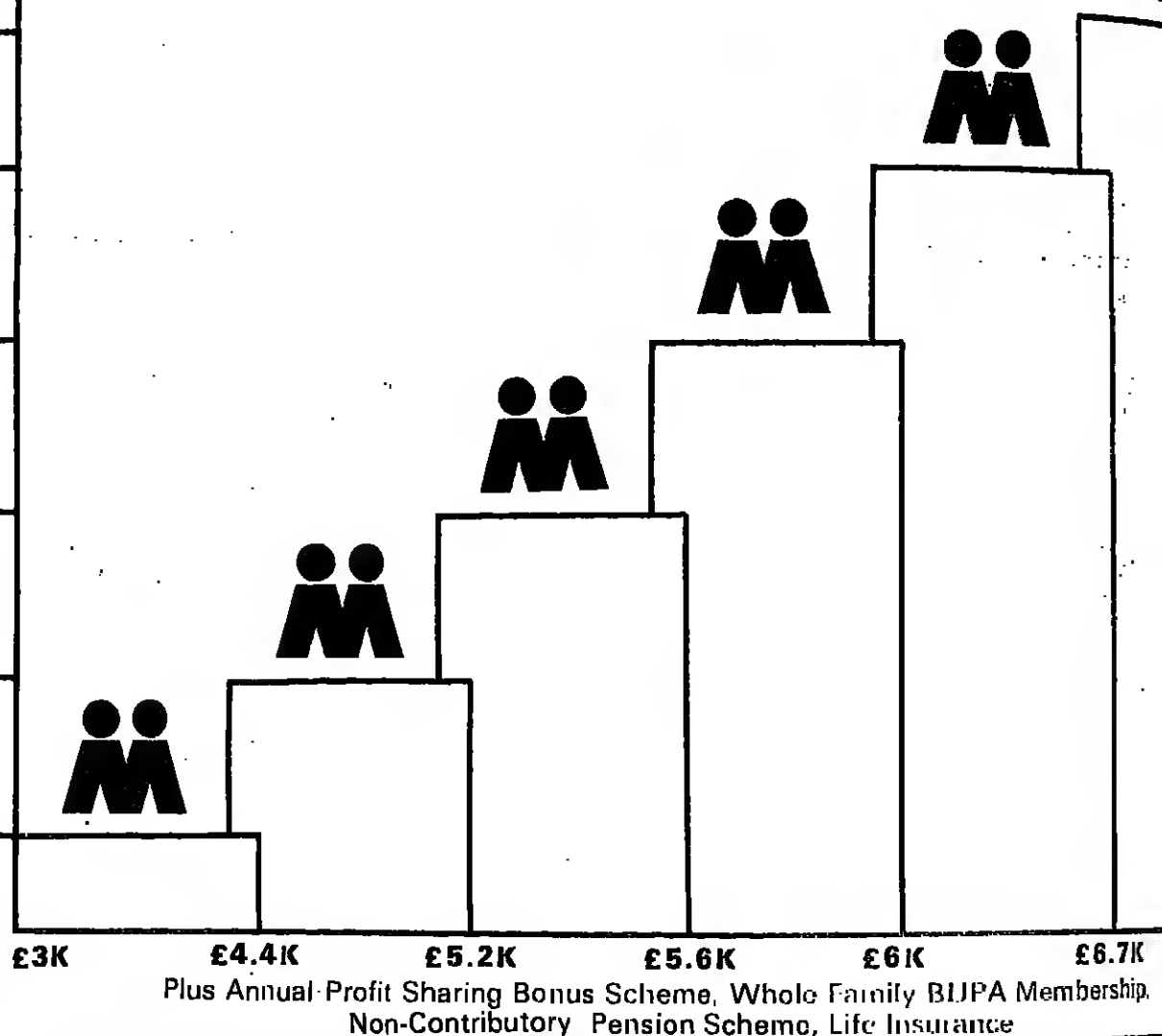
With programming experience of COBOL or ASSEMBLER on any of the following machines.

IBM 360/370's, ICL 1900, 2900's, ICL System 4's, Honeywell 2000 or 66 series, NCR Century Range and Univac 1100 or 9303's.

YOUR CHANCE TO STEP ON AND STEP UP!

Mouncey's are part of the Knight Wegenstein / Lester B. Knight International Management Consultancy Group

Ring Mel Bixley (Director) or John Birch (Head of Development)
01-903 4901



TECHNICAL SYSTEMS GROUP — FORTRAN PROGRAMMER

Systemshare operates a U.K. Timesharing Service based on Honeywell GE 400 and Series 8000 Computers.

The Technical Systems Group develops and maintains an expanding range of applications for a wide variety of technical users and enjoys an excellent reputation for the quality of its customer support service.

An additional programmer is required for our Edinburgh office. Applications are invited from candidates who must have a minimum of two years' experience in the FORTRAN environment; be capable of working under pressure and have a genuine interest in the involvement and management of many different technical applications.

Write for application form (quoting Ref. A.77.36) to:

Personnel Manager
Systemshare Limited
East Piton
Edinburgh EH6 2XT

(A Member of the Raycliffe Persons Group)

SYSTEMSHARE LIMITED

BASSETLAW DISTRICT COUNCIL COMPUTER PROGRAMMER

Salary Grade — A.P.3/4 (£3,365-£4,214)

Applications are invited for the above post in the Computer Section of the Chief Executive's Department based at Highfield House, Carlton Road, Worksop.

An ICL RJE 7020 data communications equipment linked to a 1904S at County Hall, Nottingham, is installed. Candidates for the post must have at least 12 months' programming experience. Knowledge of communications, direct access and George 3 operations will be advantageous. A proportion of the duties will be devoted to maintaining existing and introducing new systems in conjunction with other Nottinghamshire District Councils.

Application forms can be obtained from the Personnel Officer, Central Depot, Municipal Buildings, Carlton Forum, Worksop, S81 0TS, telephone No. 5531, extension 255, and should be returned by Wednesday, November 23rd, 1977.

COMPUTING ASSIGNMENTS UK AND OVERSEAS

PRODUCT MANAGER Digital Solid State Memories.

PRODUCT MANAGER Linear Integrated Circuits.

These two posts carry full responsibility for profit and loss with the fastest growing European Electronic Components Distributor.

Applicants are expected to have good academic background with a well developed and mature understanding of distribution together with negotiating skills suited to dealing in the computing, industrial and professional military markets.

Location: Home Counties. Plus frequent travel to U.S.A.

Salary: Basic £8,000 plus performance bonus based on profits. Earnings should exceed £10,000.

Benefits: Company Car + Pension Plan. MS 11/08

COMPUTER SYSTEMS DESIGN ENGINEER

To design and implement the application of computers in the process industries. Applicants are likely to have experience of electrical and instrumentation control engineering in the steel, chemical and petrochemical industries and be totally conversant with hardware and software necessary to commission and install complete working systems.

Location: North East England.

Salary: £8,000

Benefits: Company car or substantial allowance. MS 11/09

COMMUNICATIONS FIELD SERVICE ENGINEERS IRAN

Installation, commissioning and maintenance of multi-station telex switching network in Iran. Must have good academic qualifications in telecommunications and 5 years minimum experience in field working with advanced message switching systems.

Locations: Tehran and Shiraz.

Salary: U.K. Basic £10,000 + generous allowances. MS 11/10

SALES ENGINEER

Major European Software House.

Experienced in selling services in the hardware and software sectors of the computing industry. Applicants with academic and working knowledge of solid state memories will be suited to this post.

Location: Central London.

Salary: £5,000 plus commission, forecast annual earnings £10,000. Company car. MS 11/11

Phone or write to B. Selvey



Malla Software (Agi)

Tel: 01-387-1603

334 Euston Road, London NW1 3BD

AA Hinton

We are a public company involved in the North East of England operating over 50 offices.

We have recently upgraded our computer to 380KD with 128K characters of LAK disc and other peripherals.

Now we are undertaking an extensive redesign of our systems and have vacancies for the professional staff.

SYSTEMS ANALYST

£4,500-£6,000 per annum

With a sound commercial and programming background, must be able to communicate with management.

PROGRAMMERS

Attractive salaries will be offered to the right who should have a good grasp of programming and at least one year's COBOL experience.

Multi-programming experience would be highly essential.

Bonus schemes are in operation.

Applications, giving details of career to date, available for personal interview to:

Personnel Manager
AMOS HINTON & SONS LIMITED
P.O. Box 24, Master Road
THORNABY, Cleveland

West Yorkshire

ANALYSTS, PROGRAMMERS AND TEAM LEADER

Required for expanding bureau and software development at Burroughs 6700/6800 computer languages desirable.

Contact: Gerry Yates, Member of the Staff, Company Ltd., Bull Green, Leeds LS16 5JH. Tel. Halifax (0422) 66085.

SOFTWARE DESIGN AND DEVELOPMENT

The use of mini-computers and microprocessors is spreading rapidly, generating exciting career opportunities for software people. One of the fastest growing application areas is in the real-time control of complex automated systems for various industrial processes.

Our client is a British company, long established internationally in the forefront of its chosen field. Their organisation embodies a Software Design Department, which undertakes the design and development of standard systems software, language facilities and compilers, as well as advanced application packages. These are used by application groups to build custom automation systems.

Increasing new product development and business expansion have generated interesting career vacancies.

Located in very congenial conditions in the Northern Home Counties, these vacancies represent an excellent opportunity for career development in one of the most exciting and fast developing sectors of computing today.

Terms of employment include an excellent Superannuation Scheme, 4 weeks' holiday, free life assurance, subsidised restaurant and sports/social facilities. Where applicable, relocation assistance is available.

TEAM LEADER - CORAL

£NEG

A Senior Software Designer, with 5/6 years' mini-midl experience mainly on compiler development (especially Coral, Fortran, Algol, Pascal, RTL2), is required to lead a team responsible for the continuing development of a CORAL compiler, including the design of major enhancements and the design and implementation of supporting software.

RW44/1

TEAM LEADER - Interactive Languages & Support £NEG

Responsible for the detailed design of interactive language systems, assemblers, linkers, etc., this Team Leader will probably have 4 years' experience on "systems" software, including interactive languages. He/she will currently be functioning as a team leader and will also have knowledge of compilers or real-time operating systems, or other relevant areas.

RW 44/2

These are primarily technical roles, but team leading ability is also essential.

SENIOR SOFTWARE DESIGNER - CORAL

Up to £7500 p.a.

Reporting to the Team Leader — CORAL, the Senior Software Designer will be responsible for detailed design and implementation of sections of the CORAL compiler.

Candidates will have some 3 years' relevant experience, of which some 50% should have been on minis.

RW 44/3

SOFTWARE DESIGNER

Up to £5500 p.a.

A man or woman with two or more years' experience is required to work in the real-time operating systems area, or perhaps detailed level compiler work.

The important qualifications for this job are application and the ability to display a creative flair to software development work. Knowledge of operating systems or compilers would be advantageous, but evidence of creativity and mental capability is more important.

RW 44/4

SOFTWARE DESIGNERS - APPLICATIONS AND SYSTEMS SOFTWARE

Up to £5500 p.a.

Possibly graded as Senior Software Designers, these men/women will join a team with the responsibility to add new application packages and operating systems and language facilities to the company's established product range.

Candidates should have 2-4 years' experience, ideally gained in a process control environment, either as a member of a custom application group, or as part of a design group. Knowledge of at least two of the following must be evident:

Process Control
Communications
Real Time Operating Systems
Language Processors
Support Systems

RW 44/5

The above vacancies are all first-class opportunities to exercise your software skills to the full. You will be working with modern computers—Digital PDP/11 range—and utilising them in a state-of-the-art, real-time process control environment. The company's systems are in use throughout the world, controlling a wide variety of industrial processes, such as steelmaking and chemical plant, and the range of applications will undoubtedly be spread even further. The environment is thus interesting and stimulating and the work demanding and fulfilling.

The company places great store by its people, who constitute its principal asset. We would, therefore, be interested in hearing from individuals who have experience in the field and have a contribution to make, even though they need not exactly fit the above job descriptions.

You are invited to telephone Tony Baker 01-489 4501 to discuss these opportunities.

hutchinson-scoggins recruitment
10 Dover Street, London W1X 3PH
Telephone 01-489 4501

HOLLAND

Our client, a leading Dutch Bank, will be conducting interviews in the UK on
17th & 18th NOVEMBER
They require experienced staff to fill the following vacancies:

THREE PROGRAMMERS SENIOR PROGRAMMER SYSTEMS ANALYST

The salary range is very competitive and ranges from:

40,000-50,000 FLS BASIC + FRINGE BENEFITS

Have you experience in the following areas:

PL1
IMS
IPT

Together with the abilities to command the respect of fellow professionals

Then please apply without delay to: Gordon Cairns, John Goldsmith Computer Services Ltd., 15 Buckingham Palace Road, London SW1

Telephone: Office 01-828 8388 Home 01-653 4227
24 hour answering service Ref. 990



WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER

John Goldsmith Computer Services Ltd., 15, Buckingham Palace Road, London, S.W.1.
Tel: 01-828 8388 - 24 hour answering service.

JOHN GOLDSMITH COMPUTER SERVICES LTD

ARE YOU INTERESTED IN ORIGINAL SOFTWARE DEVELOPMENT?

A series of development projects on **COMPILERS, DBMS and TRANSACTION PROCESSING SYSTEMS**, are currently being undertaken by the software development group of this major manufacturer of mini computers. Based just outside London, this small group has total company-wide design and development responsibility for these projects.

If you are young (less than 30), intelligent, and enjoy creative programming (or even are bored with applications work), then these positions offer an unusually stimulating environment. The working surroundings are especially pleasant. Facilities include three systems dedicated to on-line program development. You will probably have some programming experience in a low-level language, real-time environment; you might well have a Computer Sciences academic background.

Above all, you will be attracted by the opportunity to create, develop and implement your own ideas in these important areas of software technology. Normal big company benefits include salaries in the range:

£4000 + £6500

RW 42/3

A NEW SALES CHALLENGE

- ★ GROWTH MARKET
- ★ HIGH EARNINGS POTENTIAL
- ★ CAREER DEVELOPMENT OPPORTUNITIES

Our clients are leaders in the field of data and message communications — one of the fastest growing markets in the world today. They have achieved their present eminence through product excellence and sheer professionalism.

There is now a ground-floor opportunity for a small number of systems salesmen to generate new business and develop the existing customer base. For those seeking new fields to conquer, this represents an opportunity to participate in the growth of a dynamic, but well established young company.

We are interested in hearing from you if you have:

- A strong personality enforced by determination and professionalism
- A real, practical interest in modern business
- A hunger for success

You will be well supported and well paid by high basic salaries and commission based on realistic targets. Company cars are also provided.

Potential earnings are unlimited, and, on the average, salesmen can expect to earn somewhat in excess of

£10,000 p.a.

RW 45/1

hutchinson-scoggins recruitment

10 Dover Street London W1X 3PH

Telephone 01-499 4501

2 key Customer Support Specialists - Australia

AS\$14-20,000

The continued growth of ICL Australia provides opportunities for experienced computer professionals. In particular, the Sydney sales region now requires two key people to provide specialised support to a growing customer base. The appointments are in:

Production Control

This position provides specialist support to customers with production control requirements. The work involves NIMMS and OMAC, and experience is required in NIMMS. You will provide sales support to customers moving to 2900 in the medium term who will then wish to implement 2900 production control software.

Operating Systems

The requirement here is to provide detailed support for operating systems with particular emphasis on George 3. You will be supporting the sales force selling 2900 DME and VME. To be successful, you should have had several years' experience with George 3.

These positions are permanent appointments. Competitive salaries are offered in the range AS\$14-20,000 according to your experience, and relocation costs will be paid for you and your family. For further information please contact Carol Hudson, ICL, Bridge House North, Putney, London SW6; telephone 01-788 7272 extension 2047. Please quote reference CW/1578.

**International
Computers**

think computers—think ICL

ICL

£4,000 to £14,000

Not some time in the future but right now, Marcol are one of Europe's leading computer service organisations, and because of our size and wide range of interests, we can offer exciting opportunities plus a variety of new experiences you would be unlikely to get anywhere else:

New machines
New languages
Advanced technology
Diverse interests
(telecommunications, aerospace and petrochemicals)
Assignments overseas

Make it with Marcol

Couple this with real opportunities for advancement and the top salaries we are prepared to offer and you'll realise you'll "make it with Marcol" sooner and in more ways than one.
Contact: Derek Ashley, 01-402 9355,
Marcol Computer Services, 60 Queens Gardens, London W2.

MARCOL

Dynamic Systems for tomorrow's needs
An associate of The Norwich Union Group.

COBOL PROG.
GLOUCESTERSHIRE

£4,000 p.a. + benefits
Phone 01-439 6481
(24 hours)
EFFECTA GRAVIS
Personal Consultants

CAPITAL APPRS.
FORTRAN
Experienced and
Graduate Trainee

Programmers
urgently required for industrial and
technical development
£7,000 p.a.
Training for high level positions
037 5557 day, 445 046 even

SHIFT LEADER
CITY
2000 P.O.
17th Nov

Phone 01-439 6481
(24 hours)
EFFECTA GRAVIS
Personal Consultants

VARIETY IS THE CHALLENGE OF THE JOB!

MIDLANDS

Our clients, the computer centre for a major international group of companies, in the engineering industry, seek computer professionals to join their data processing department developing systems for approximately twenty companies throughout the U.K. The well managed installation comprises of a large IBM 370 series machine; supporting a comprehensive tele-processing network utilising "CICS".

Programmers

Salaries to £4,500

Our clients require a minimum of 12 months experience of PL/I. The successful candidates will be working in a project orientated environment, where the considerable number of companies supported, ensures continuous challenge. Excellent opportunities for promotion exist for suitably motivated people.

Analyst/Programmers/ Systems Designers

Salaries to £5,500

For this position, our clients require a minimum of two years grounding in PL/I, combined with demonstrated experience of analysis or systems design. Successful applicants will receive formal systems training and will be initially involved with on-line order processing, production control and accountancy packages. Successful candidates may be expected to liaise at all levels within the group companies and work on a cost effective basis.

Analyst and Senior Analyst

Salaries to £8,500

Successful candidates should have a minimum of three years systems experience; gained in a commercial or manufacturing environment. They will be involved in proposals, development and budgeting of systems for member companies. Experience of high level meetings with financial and manufacturing line management would be a distinct advantage for these positions.

The site is located within daily travelling distance of Birmingham/Wolverhampton, and their close proximity to the motorway network enables easy access to rural Warwickshire, Worcestershire and Staffordshire. They offer large company benefits including pension and life assurance schemes, sports and social facilities (including squash courts), generous holiday entitlement and excellent relocation expenses where applicable.

For further details contact: ROD BEESON on 021-236 3781

REF. NO. CW/11/7

SPECIALIST COMPUTER RECRUITMENT LTD

BIRMINGHAM 021-236 3781 FREEPOST
Freepost, Equity and Law House, 35-37 Great Charles Street, Birmingham B5 9ER

MANCHESTER 061-633 0676 FREEPOST
Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 6BD

LONDON 01-935 0671 FREEPOST
Freepost, 10, Abchurch Lane, London EC4N 3DF



A CAREER WITH ALEX. LAWRIE FACTORS PROGRAMMER

Company We are a leading British Factoring Company with an annual turnover currently approaching £100 million, specialising in providing finance for commerce and industry.

Equipment I.C.L. 1901T with 36K, EDS 80s, Mag. tapes and VTE.

Applicant A COBOL programmer is required to work with a small team in a financial environment. The salary will depend upon experience and the post carries excellent fringe benefits.

Interested? Please contact:
Mr. M. J. Personage
Personnel and Training Manager
Alex. Lawrie Factors Ltd.
Barnum House, Barnum Road
Banbury, Oxon OX16 7BN
Telephone: Banbury (0298) 4481

SOUTH WESTERN Regional Health Authority

Computer Programmer

Salary Scale: £3534-£4344 p.a.
(plus Phase I and II supplements)

Experienced programmer required immediately with good COBOL experience and preferably familiar with ICL/Honeywell products.

The Computer Department is expanding into the communications field: present installation: ICL 2803 for TP work; also Honeywell 2080, due to be replaced with ICL 2880 in 1979. The work commitment involves developing financial and medical systems for the new equipment and the current batch systems.

Application forms and job descriptions obtainable from: the Regional Personnel Office, Establishment Section, U.T.F. House, 26 King Square, Bristol BS2 8JY.
Closing date: 23rd November, 1977

Assembler Programmers Project Leaders

HOW GOOD ARE YOU?

6 Prizes of £20
6 Prizes of £10

Certificates of Merit for all
correct entries

After execution of the following code:

PROGRAM	CSECT	
	BALR	12,0
	USING	*12
OTHER	LM	15,4 FULLWORD
	USING PROGRAM,15	
	EX	1,MSGMVC
INSA	BCT	4,TEST
INSB	B	TESTB
FULLWORD	DC	A(OTHER)
	DC	A(17,L' MSG1,MSG1,18,2)
MSGMVC	MVC	MSG(1),0(2)
MSG1	DC	CL4' ABCDEFGH'
MSG	DC	CL4' IJLK'
	DROP	12
TESTB	CLI	MSG1,C' A'
TEST	LA	0,25(0)
TESTA	SH	3,FULLWORD+6

- Q1 Has the instruction 'TESTB' been executed?
Q2 Which instructions, if any, have been altered (and how)?
Q3 Which are the contents of the field 'MSG'?
Q4 Which base register is used by the instruction 'INSA'?
Q5 Which base register is used by the instruction 'TESTA'?
Q6 What does register 0 contain?

- A1 _____
A2 _____
A3 _____
A4 _____
A5 _____
A6 _____

Good Score? Drop in to check your answers at 184 New Kings Road, Fulham SW6, where you will also find out more about SDI and the career opportunities that are currently available.
(Nearest Tube Station, Putney Bridge).

If unable to call please mail your answers along with your name, address, home and business telephone numbers to:-

SDI, 184 New Kings Road, London SW6.

For more information about career opportunities, phone Ian Marr at 01-736 1382.

RULES

- Personal entries may be delivered personally to SDI at any time before 8.30pm on Friday, 11th November 1977.
- Postal entries may be postmarked any time before 12 noon on Monday, 14th November 1977.
- Personal entry prizes will be drawn at SDI at 8.45pm on Friday, 11th November. Prizes will be awarded at 7pm. Prizes of £20 will be awarded for the first six correct entries opened.
- Postal entry prizes will be drawn at 8.45pm on Tuesday, 15th November 1977. Prizes of £10 will be awarded for the first six correct entries opened.
- A certificate of merit will be awarded for each correct entry received.

SDI

Sales Executives

Do you want a divorce?
Are you tired of your present company?
Does it really appreciate what you are trying to do for it?
Does it have a product you are proud of?
Is your work exciting?
If your answer is yes yes no no
It's time for a second marriage
Exciting things happen with Prime

In four short years we have built a worldwide company and launched three new series of super-powerful mini computers. We operate from five different offices in the UK and are busy opening three more. The odds are that wherever you live we are interested if you are good enough for us.

We only employ real professionals, and the present team is hand-picked to be the best in the industry. We want to expand our team but we won't compromise on quality.

We want experienced sales professionals who won't settle for a quiet cosy life working 9-5 and waiting for the boss to drop dead.

We want active, positive-thinking people who can really work on their own initiative. We'll work you until you drop, and we will reward you to the highest industry standards for doing it.

Prime is a challenge - an exciting challenge and really we are only just beginning.

Interested?

Ring 01-958 6138 or ask for Wendy or Stuart to 5pm

All we need is a three minute chat and your name and address. We will take it from there. Why not call us today? (or write if you must)

PS. we will be at Computex too if you would like to take a look at us. Stand U79/U80

Prime Computer (UK) Ltd.,
The Coach House, 173 Sheen Lane, East Sheen, London SW14 4NA

PRIME

SYSTEMS ANALYST K12,000
OPERATIONS SUPERVISOR/INSTRUCTOR K11,000
ANALYST/PROGRAMMERS (2) K10,000
SYSTEMS PROGRAMMER K10,000
(CURRENT EXCHANGE RATE K1=70p)

Mezamba Tractor Company Ltd., the Caterpillar earthmoving equipment dealership in Zambia, has vacancies for the above staff.

The IBM computer currently in use is a 384K 370/135, running under DOS/VS/POWER. Already operational applications include on-line inventory control systems running under CICS and batch financial systems.

Additional staff are now required in order to implement computer systems in the other group companies as well as on-going development for Mezamba.

The Systems Analyst should have a minimum of 2 years' experience including design of on-line systems. The Operations Supervisor/Instructor will be required to devise and implement a training scheme for Zambians in the operations area. The Analyst/Programmers should have a minimum of 2 years' experience of PL/1 programming. An ability to devise a formal training course for Zambians would be an asset.

The Systems Programmer should have approximately one year's experience of DOS/VS and will be required to carry out some applications programming using CICS/VS.

All applicants must be in possession of a Degree and/or membership of a professional computer body.

The terms of employment will be on a mutually renewable 2-year contract and the Company will provide in addition to the basic salaries quoted above:

- 25% gratuity on all contract earnings
- Fees furnished accommodation
- Return air fares for the applicant, and family (if any)
- Assistance with the applicant's children's education fees where appropriate
- Baggage/setting-in allowances

The O.P. Manager will be conducting interviews in London early in December and applications should be in the first instance be addressed to:-

Mr. G. S. Peterkin
P. H. Recruitment Limited
Excel House
42 Upper Berkeley Street
LONDON W1H 7HL

1900 OP
GEORGE H
WEST LONDON
To £4,000 p.a. + bonus
Phone 01-339 6481
(24 hours)
EFFECTIA GRAVIS
Personnel Consultants

SYSTEMS PRG.
PLAN EXPERIENCE
WEST LONDON
To £5,500 p.a.
Phone 01-339 6481
(24 hours)
EFFECTIA GRAVIS
Personnel Consultants

KENT COUNTY COUNCIL

Systems Analyst WITH VISION

We not only want a person capable of performing the routine tasks of systems analysis effectively, we also need the ability to help our users and the system in the environment in which they work.

Kent County Council are fully aware of the contribution a good analyst can make to the effectiveness of the organisation. Our Users are paramount and we need people who are not afraid to guide them into achieving improvements to the way they do things.

Attractive salary plus assistance with relocation expenses if necessary, leading pleasant surroundings in an ideal part of the county.

If you feel that you can fill this position please send your CV to: Mr. J. R. Bateson, 285, or write to the Development Manager, Kent County Council, Computer Unit, The Air Station, West Malling, Kent, for an application form.

ELECTRONIC TEST ENGINEER

EC2 depending on age and experience

The Exchange Telegraph Co. Ltd. have a vacancy for an Electronic Test Engineer at their Engineering Department, EC2. Responsible to the Technical Manager, the Engineer will be involved in testing and repairing electronic equipment, printers, and associated equipment and will be responsible for the development of special customer requirements, including documentation and drawings.

Candidates, aged 20-40, must have an appropriate qualification in Electronic Engineering and have had experience in testing, repairing and commissioning electronic equipment. The Company benefits include 4 weeks' holiday, pension scheme and L.V.O. Hours of work are 9.30am to 5.30pm, Monday to Friday.

For further details, please telephone Miss A. Redman on 01-253 1000 ext. 211.

CURRENT SELECTION

Operators to Shift Leaders
£2,000-£4,500 (incl.)

LONDON & HOME COUNTIES

We have many vacancies covering all types of machines and locations. Some firms will retain from one manufacturer to another. Remember those positions are for shift working only. Hurry whilst stocks last. CW 45/1 Patricia.

New Sales Support & Sales
Opportunities - UK

A major international computer manufacturer is announcing in Europe an exciting proven range of small computers in the New Year. They therefore immediately require Branch Managers, Systems Analysts, Salesmen and Technical Support Personnel as well as a UK Training Officer. Previous experience should be with RPGII type computers or mini computers using commercial skills with a professional approach to problem solving. Personnel will have a marvellous opportunity to get in on the ground floor where salaries will be very competitive. Vacancies exist in W. LONDON, BIRMINGHAM, MANCHESTER and LEEDS. CW 45/2 Michael.

Successful Salesmen
to £12K quota earnings

U.K.

We now have 12 different firms for both hardware and systems only companies who are anxious to meet successful salesmen in this industry. They just have previous relevant small systems experience (some VRCs will be considered). All firms have bonus schemes and cars or car allowance. Most positions in S.E. England, but three in Midlands. CW45/3. Michael.

Systems Consultants
£5,000-£9,500

CENTRAL LONDON

Seven large well-established consultancies wish to recruit systems people with all-round experience on third generation equipment and the right personality to deal with clients who require a first rate service. Technical communications consultants are also required where in-depth implementation experience of IBM or ICL T/P message switching networks, etc., are essential. Excellent fringe benefits and prospects. CW45/4. Michael.

Mini Computer Programmers
to £6,950

U.K.

Your experience is required now. A very large number of vacancies are registered where a knowledge of Assembler or communications experience is essential (VRC programmers would also be considered). Opportunities exist in S.W., N.W. or W. London, Surrey, Herts. and Manchester in this exciting and rewarding field. There has also been registered some overseas posts to people with five or more years in mini computers. CW45/5. Michael.

Contract Programmers
to £190 p.w.

U.K.

Immediate requirements for IBM RPG II & IBM COBOL under DOS or OS for C. London. PL/1, OS or CICS, PDP/11 or good IMS for various locations for three months plus. Also IBM vacancies in GERMANY, BELGIUM & HOLLAND. Ask for the Controls Officer on 01-995 2238. CW45/8. Michael.

PLEASE EITHER COMPLETE THE FORM
ALONGSIDE OR TELEPHONE UCA FOR DETAILS
OF THESE AND SIMILAR VACANCIES.

01-995 3883
CONTRACT STAFF
01-995 2236

UNIVERSAL COMPUTER ASSOCIATE RECRUITMENT CONSULTANTS

UCA LEADS THE WAY

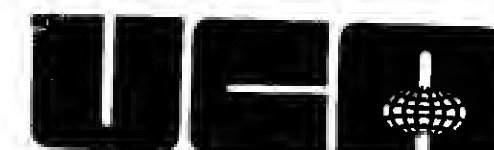
Universal Computer Associates, established in 1969, has registered nearly 14,000 applicants in the D.P. industry and has subsequently filled vacancies within every type of organisation both in the UK and overseas.

If you are thinking of using a successful and friendly consultancy, whether it is for PERMANENT or CONTRACT vacancies, or for people to fill them, then UNIVERSAL COMPUTER ASSOCIATES ARE AT YOUR SERVICE.

Phone: 01-995 3883 or 01-958 6138 up to 10 p.m.

PROGRAMMERS, ANALYSTS, CONSULTANTS

YOUR CAREER IS VITAL —
LET US IMPROVE IT FOR YOU!



Computer Services & Recruitment Consultants

UNIVERSAL COMPUTER ASSOCIATES

Data Express House

3 Prospect Place, Heathfield Terrace, Chiswick, W4, 01-995 3883

Name (full)	UCA No.:		
Address	Telephone (home)		
	(used discreetly) (work) Ext.		
	Position required		
Age	Marital status	Salary required	
Period of notice	Children's ages	Areas required	
Car owner/driver	Foreign languages?	Willing to move? Within UK: Yes/No Overseas: Yes/No	
Education — 'O'/'A' levels/degrees/other	Areas considered LONDON Yes/No		
	Installation preferred		
EDP courses	Join a progressive software house/Consultancy/Bureau? Yes/No		
	Interested in freelance work?		

EMPLOYMENT RECORD

Dates & final salary (most recent first)	Employers (most recent first)	Computer & model	Programme languages & operating systems	Position, duties and applications undertaken and completed

EDP EXPERIENCE

Time period to nearest quarter year: Operating	Programming	Sales/other
Control procedures	Systems	Management
Total in DP		
Languages and operating systems you know well		
Assess your experience: S=some A=adequate F=full (leave blank if not relevant) of the following		
VRC/Word Processing	Time Sharing	Database Design
JCL	Microprocessors	
Drum	Disk	MICR/OCR
VDU	Data transmission	Real time
Software development	Scientific programming	Production control
		Accountancy

HURRY POST NOW!

No stamp needed if you post to Universal Computer Associates, 3 Prospect Place, Heathfield Terrace, Chiswick, W4, 01-995 3883

01-995 3883

WORLD LEADERS IN DP RECRUITMENT TECHNOLOGY

EMS

**EMS COMPUTER
24-hour emergency service**

EUROPE'S LARGEST D.P. CONSULTANCY

Telephone today for immediate computer searches against all your outstanding requirements. E.M.S. offer the largest international data bank of candidates available world wide. For the most professional, sophisticated Recruitment Consultancy, E.M.S. stand supreme. E.M.S. get results! Select from thousands of candidates on our files. Telephone or write for us to resolve all those outstanding recruitment problems. All leading D.P. users use E.M.S. You probably do also — but now, please note the sophisticated additional services available.

E.M.S. CONSULTANTS LTD
61 LOWER STREET
NEWCASTLE-UNDER-LYME
STAFFORDSHIRE ST5 2RS

- EMS GROUP SERVICES**
- * Low cost advertising facilities
 - * Pre-interviewing and shortlisting facilities
 - * Client interviewing facilities — Birmingham, Newcastle (Staffs.)
 - * Systems, Programming and Operations Help Services
 - * Training/Conference Facilities (Birmingham Data Centre)
 - * Bureau & Time Sharing Services — All machines
 - * Turnkey Systems
 - * Software — Applications Packages
 - * Facilities Management

ICL New Range Programmers South West & West Country To £7000

We urgently need staff experienced on New Range for a number of large users, including manufacturers and bureaux. Vacancies offer permanent employment or contract status, according to individual experience. Work functions include working on new application systems, developing new software, compiler design, emulation systems and a wide variety of technical and scientific functions. Attractive fringe benefits also exist with leading clients for contract staff.
Consultant: Niall Bradley.

IBM Programmers Derby To £4500

Our clients require a number of additional Programmers and Programmer/Analysts to work in small project teams split, each with 50% development, 50% maintenance. Projects generally are commercial batch work, Payroll, Accounts, Sales, Stores, etc. Language experience should be ASSEMBLER, COBOL or PL/I. Some on-line development is envisaged within the next 2 years.
Consultant: Selina Mills.

Sales Support Programmers & Analysts Edinburgh To £5500

Minimum 'A' Level qualifications will apply. Candidates will be in charge with current driving licences and show a good aptitude for client liaison. Outlets will include feasibility studies, writing proposals on post sales consulting. Basically, you would advise and guide clients on new hardware ranges. Both Analysts and Programmers must have at least 2 years' COBOL or ALGOL programming experience.
Consultant: Selina Mills.

Business Analyst Staffs Analyst/Programmer Wilts £4000-£5500

Hardware preference will be for ICL COBOL in a manufacturing systems environment using on-line and RJE. The Analyst/Programmer will be required to investigate and design minor projects either alone, or as part of a project team. Some programming will also be required. The position would suit a Programmer with 2 years' experience wishing to move into Systems Analysis.
The Business Analyst will be responsible for all systems development within the Willenhall area, reporting to the Chief Systems Analyst at Swindon. Applications will be broad but related to Engineering/Manufacturing in content, and are likely to be on-line to the Swindon mainframe via an RJE terminal.
Consultant: Don Walklate.

Leading Vacancies Middlesex To £6500

Project Leaders, Senior Analysts, Analysts, Program Designers, Chief Programmers and Programmers.
Opportunities exist with a large group, substantially increasing their investment in modern, sophisticated hardware, for a wide range of experienced DP staff. Experience in the following areas is urgently required: Production Control, On-line/Real time Systems, Database development, general commercial Accounting and Sales Order Processing, down to COBOL programming. Opportunities not to be missed in the MIDDLESEX area.
Consultant: Selina Mills/Carol Proudman.

IBM Analyst Manchester To £4800

Good commercial experience in an IBM environment is sought. Ideally applicants should have worked at least 2 years in a similar position. The group have experienced international clients and supply engineering products to a large consumer market.
Consultant: Don Walklate.

IBM 370 PL/1 & Assembler South Midlands To £7000

Any experience of IMS would be especially welcomed. We have urgent, long-term requirements for a leading industrial group about to embark upon a major systems development extension. Experience of working in a manufacturing industry would be advantageous. Staff will be expected to work in large project teams, involving a tight schedule control. Opportunities also exist for travelling throughout the U.K. to other group sites if required during latter 1978. Attractive salaries will be paid to a wide range of applications and software support staff with 2 years' and more practical experience.
Consultant: Niall Bradley.

ICL 1900 COBOL Programmers West Country To £5000

A small Gloucestershire bureau has vacancies for additional Programmers to assist with developing client accounts. Candidates will be given appropriate applications training where necessary. Opportunities exist for both Junior and Senior staff working in a very popular location with good middle term career prospects.
Consultant: John Wood.

Systems Programmers, Systems Designers, Systems Engineers London To £5300

A large banking group have numerous vacancies for staff experienced in DOS/VS, ASSEMBLER or COBOL and possibly CICS. A minimum 2 years' IBM with experience of financial system or banking would be of special interest. Equalities working conditions are available at a convenient City location.
Consultant: Selina Mills.

Systems Analysts West Midlands To £4400

Programmer will be for candidates educated to at least HNO level. Their main activities of systems development include investigation of existing systems and assessment of future requirements. Preparation of initial reports and agreements with users. Preparation of individual program specifications including test data. Systems testing and Pilot/Pilot running and completion of test schedules which must be adhered to.
Consultant: John Wood.

IBM 370 PL/1 Analysts/ Programmers Lancashire To £7000

Any experience of IMS would be especially welcomed. We have urgent, long-term requirements for a leading industrial group about to embark upon a major systems development extension. Experience of working in a manufacturing industry would be advantageous. Staff will be expected to work in large project teams, involving tight schedule controls. Opportunities also exist for travelling throughout the U.K. to other group sites if required during latter 1978. Attractive salaries will be paid to a wide range of applications and software support staff with 2 years' and more practical experience.
Consultant: Niall Bradley.

EMS
Consultants Ltd

EMS Consultants Ltd
61-63 Lower Street
Newcastle-under-Lyme
Staffs ST5 2RS
Telephone 0782 62366
(10 lines)

Register NOW

EMS

EMS CONSULTANTS LTD
61 LOWER STREET
NEWCASTLE-UNDER-LYME
STAFFORDSHIRE ST5 2RS
Tel: 36836

Management Services & Computing Division
Telephone: 0782 62366/6/7/8
Employment Agency & Employment
Business License No. M56
© C1 Forms Design EMS Copyright March 1977

SURNAME Other Names		Telephone	
Address		Home	
		Bus	
Post Code		Ext.	
Age	Date of Birth	Place of Birth	Nationality
Married	Children	Car Owner	Driver
Position Required		Required Salary Range	
Present Position		Salary	
WHERE DO YOU WISH TO WORK			
Within U.K.	Yes/No	Acceptable Areas	Abroad
Will you move	Yes/No		Europe
		Middle East	
NUMBER OF YEARS EXPERIENCE			
Designing	Programming	Systems Design	Systems Analysis
			Management
Total			
Available for Interviews			
Available for Employment			
DETAILS OF SECONDARY AND FURTHER EDUCATION			
Schools	Date	Examinations Passed	
College/University	Date	Examinations Passed	
Business Courses with Dates			
1. Present Employer			
Position	Town		Date Joined
TYPE OF INSTALLATION			
Commercial	Bureau	Insurance	Scientific
Manufacturing	Banking	Education	Engineering
HARDWARE		OPERATING SYSTEM	
		LANGUAGES	
Software or Packages			
On-Line	Real Time	Time Sharing	
R.J.E.	Tele Processing	Data Base	
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN (Please Tick)			
Cost Accounting	General Ledger	Manpower Planning	Personnel
Budgeting	Credit Control	Stock Control	Payroll
Forecasting	Order Processing	Production Control	O.R.
Corporate Planning	Marketing	Petrochemicals	Radar
Sales Ledger	Distribution	Linear Programming	Statistics
Purchase Ledger	Traffic Analysis	Simulation	
Projects Completed		Responsibilities	
2. Previous Employer			
Position	Town		Date Joined
TYPE OF INSTALLATION			
Commercial	Bureau	Insurance	Scientific
Manufacturing	Banking	Education	Engineering
HARDWARE		OPERATING SYSTEM	
		LANGUAGES	
Software or Packages			
On-Line	Real Time	Time Sharing	
R.J.E.	Tele Processing	Data Base	
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN (Please Tick)			
Cost Accounting	General Ledger	Manpower Planning	Personnel
Budgeting	Credit Control	Stock Control	Payroll
Forecasting	Order Processing	Production Control	O.R.
Corporate Planning	Marketing	Petrochemicals	Radar
Sales Ledger	Distribution	Linear Programming	Statistics
Purchase Ledger	Traffic Analysis	Simulation	
Projects Completed		Responsibilities	
PLEASE CHECK THAT EACH SECTION HAS BEEN TICKED APPROPRIATELY			
ADDITIONAL INFORMATION:			
General			
Data Processing			
Terminals			
Software/Packages			
Application Areas			
Projects and Responsibilities			

E.M.S. is a service for the right people in the right jobs in the right places. We are a leading international recruitment consultancy, providing a wide range of services to our clients. We are a leading international recruitment consultancy, providing a wide range of services to our clients. We are a leading international recruitment consultancy, providing a wide range of services to our clients.

For Office Use only

Company Ref. No.

Reason for Seeking Change			
Details of type of position wanted			
Additional Information — Please explain below, in an 8-10 line space, your current duties and applications experience			
FOREIGN LANGUAGES			
Spoken	Written	Read	
Please show the number of years experience of the following. Where your experience is not specified please so use the blank spaces.			
HARDWARE	OPERATING SYSTEM	LANGUAGES	PACKAGES/SOFTWARE
IBM 360/370	DOS	COBOL	FILETAB
ICL 1900	OS	FORTRAN	DRIVER
ICL 2980/2970	MVT/MFT	ASSEMBLER	CICS
ICL 2903	GEORGE 1	PLAN	IMS
UNIVAC 1100	GEORGE 2	PLI	BOMP
UNIVAC other	GEORGE 3	RPG 2	D BOMP
BURROUGHS 700/800	MCP	USERCODE	PERT
BURROUGHS other	Exec 8	AUTOCODE	V SAM
HONEYWELL 66	GCOS	EASYCOOPER	IDS/TDS
HONEYWELL 6000	OS 2000/200	ALGOL	MICROFILMING
HONEYWELL other	VMEB/VMEK	NEAT	TELEPROCESSING
NCR	J Level	CORAL	DMS
ICL System 4		DL1	
POP			
3. Past Employer			
Position	Town		Date Joined
TYPE OF INSTALLATION			
Commercial	Bureau	Insurance	Scientific
Manufacturing	Banking	Education	Engineering
HARDWARE		OPERATING SYSTEM	
		LANGUAGES	
Software or Packages			
On-Line	Real Time	Time Sharing	
R.J.E.	Tele Processing	Data Base	
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN (Please Tick)			
Cost Accounting	General Ledger	Manpower Planning	Personnel
Budgeting	Credit Control	Stock Control	Payroll
Forecasting	Order Processing	Production Control	O.R.
Corporate Planning	Marketing	Petrochemicals	Radar
Sales Ledger	Distribution	Linear Programming	Statistics
Purchase Ledger	Traffic Analysis	Simulation	
Projects Completed		Responsibilities	

Handwritten note: 154

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

BE SUCCESSFUL — JOIN MYRIAD Senior and Junior Consultants

Recruitment consultancy at Myriad is unlike the conventional desk bound telephone job you might imagine. It entails visiting clients from all types of industry and meeting people from all walks of life. It provides immense satisfaction through assisting major organisations recruit computer professionals and ensuring individuals receive a confidential service geared to achieve their personal career progression.

Our consultants gain an interesting insight to a wide spectrum of industry and broaden their knowledge by exposure to the latest equipment and techniques being used with all types of manufacturers' equipment.

We are interested in talking to people who feel they may be interested in recruitment consultancy with Myriad. Applicants should either be experienced in recruitment or have a successful record in any area of data processing, in which case they will receive full training. They should be literate and seek success.

The Company is well established and provides excellent support to its consultants in this comparatively youthful sector of the d.p. service industry. Our consultants are limited solely by their own ability and they enjoy working in a professional environment without constraints.

The conditions of employment are very good and offer a secure and progressive future. An excellent commencing salary is further enhanced by a generous monthly profit sharing scheme geared to individual performance.

Please telephone for a confidential discussion or write to:
30 Fleet Street London EC4Y 1AA
01-353 5868

OPERATORS

YOUR CHANCE FOR A NEW CAREER IN THE NEW YEAR

If you have been working on-shift for over 12 months now is the time when career progression, salary and the working environment is becoming important to you.

We have clients ranging from small rural sites to large bureau installations who are looking for operators with experience of IBM (inc. System 3), ICL, HONEYWELL or NCR mainframes.

Why not telephone me to discuss the range of opportunities available in the areas you wish to work.

Telephone in absolute confidence:

Ray Slattery

D.P. RECRUITMENT LIMITED
Kent House, 87 Regent Street, London W1R 7HF
Tel: 01-437 2062/3/4 (24-HOUR ANSWERPHONE)

THORNTON BAKER COMPUTER BUREAU

The bureau based in the Midlands, serves Thornton Baker & Co., a large national firm of chartered accountants. The department is growing steadily and a very active period of computer developments has been planned for the future.

Assistant to the Bureau Manager £6,500

Responsible for control systems and programming development work as well as being the deputy for the Bureau Manager.

The successful candidate will be aged 25+ with a minimum of 5 years' system/programming work and a knowledge of ICL hardware and software, Cobol and some experience of Database. An important quality will be the ability to communicate effectively with all levels of staff.

Reasonable relocation expenses will be available.

Ref: AC 131.

Operations Controller £3,750

To be responsible for the operations of an ICL 2803.

A knowledge of operating systems and communication equipment preferably together with ICL 2803 experience.

The ideal candidate will probably have had 3 years' experience as a computer operator/data control clerk.

The salary will be dependant upon age, qualifications and experience.

Ref: AC 132

Applications giving brief details and quoting the above references should be addressed to:

G. H. Jones, Thornton Baker Personnel Services Ltd., Kennedy Tower, St. Chad's Queensway, Birmingham B4 6EL.

Interviews for the above vacancies will be held throughout Britain.

A member of the Management Consultants Association.

THE UNIVERSITY OF ZAMBIA

Applications are invited for the following posts which will be created at the beginning of 1978, in the Educational and Research Computer Bureau of the Computer Centre. Full posts are available to holders of a degree in Computer Science or equivalent. The successful candidates will be employed on the University of Zambia scale of pay.

SYSTEMS ANALYST

Applicants must hold a degree or equivalent, with relevant experience in systems analysis and design. Preference will be given to holders of a degree in Computer Science or equivalent.

COMPUTER PROGRAMMER (COMMERCIAL)

Applicants must hold a degree or equivalent, or a 'C' level or equivalent grade, and have considerable COBOL programming experience. The applicant will write and maintain COBOL programs to run on the ICL 2803 computer with 1.5 M.B. 200 K. University of Zambia scale of pay. Salary scale: £2,000 - £3,000 p.a. (starting at £2,000 p.a.) plus 10% per annum. For single applications, please send your curriculum vitae and a recent photograph to the Registrar (Education), University of Zambia, P.O. Box 222, Lusaka. Closing date: 18 December 1977. Applications received in UK should also send one copy to the University Council, 80-81 Tottenham Court Road, London W1P 0BT. Further particulars may be obtained from other sources.

experienced polytechnic

Programmer

A programmer is required in the Computer Centre of the Polytechnic. Applicants should have a degree or equivalent and have a good working knowledge of one or more of the following languages: FORTRAN, ALGOL, COBOL or PLAN. The Polytechnic has an ICL 1903T running under GEORGE II and MAXIMOP. Salary in the range £3368 to £3702 plus £312 and Phase 2 supplement.

Application forms and further details are available from:

The Administrator
Oxford Polytechnic
Oxford OX3 0BP

TECHNICAL AUTHORS

required to write Software Manuals. Experience in Fortran or Cobol.

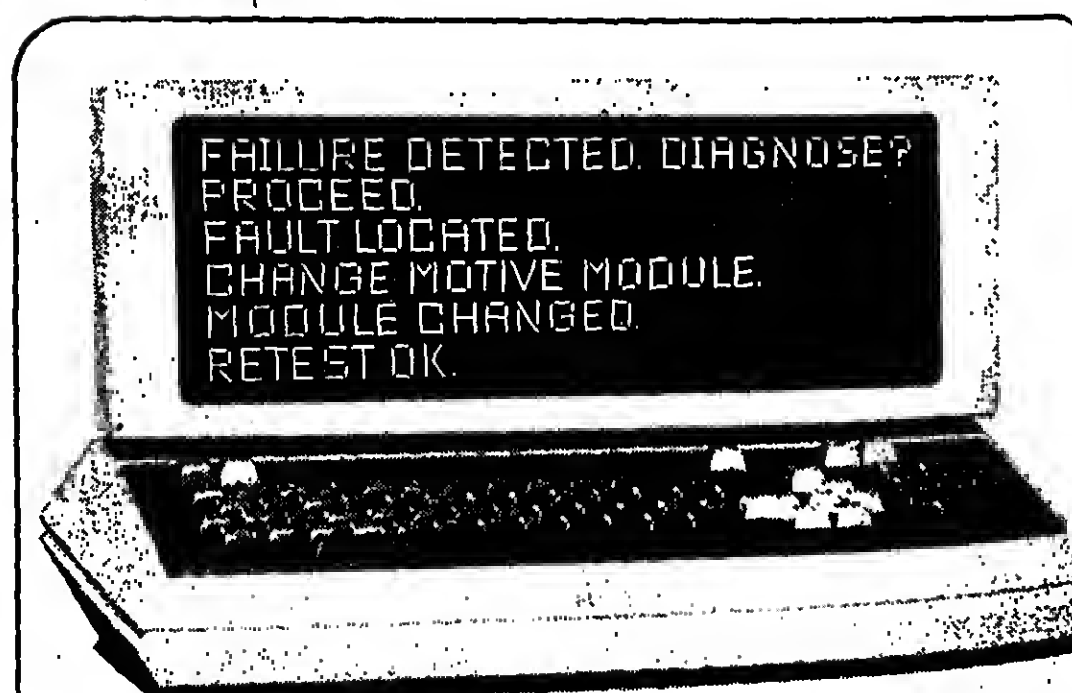
Contract in Paris.
£5 per hour

Contact:
Willin Writing
Services Ltd.
0252-41876

PROGRAMMERS

WEST COUNTRY
1900 COBOL
£4000

Phone 01-439 6481
(24 hours)
EFFECTIA GRAVIS
Personnel Consultants



Diagnostics

Project Ptarmigan is a mobile, flexible, digital communications system for the British Armed Forces.

We require hardware and software personnel with an interest in diagnostics to develop and implement both diagnostic and executive software to achieve self diagnosis by the system.

Specific diagnostic experience is not essential but previous hardware and/or software experience is expected.

The Ptarmigan Switch Unit is one of the high technology businesses of the Poole site, which employs in total some 2,000 people, and provides a continuing opportunity for career advancement and development.

Plessey Poole is located in a particularly pleasant part of the South Coast. An attractive salary package is offered which includes immediate entry into the Company's pension/life assurance scheme. Where appropriate, generous relocation expenses will be paid.

Take advantage of this opportunity and contact George Wagstaff, now at Poole (0201-3) 5161, reversing the charges, or write to him at The Plessey Company Limited, Sopers Lane, Poole, Dorset BH17 7ER, quoting ref. TV12.

PLESSEY

PRE AND POST SALES SUPPORT ANALYST LONDON AND MIDLANDS DISTRIBUTIVE PROCESSING

Salary circa £8,000 per annum, plus company car and excellent fringe benefits.

This is an excellent opportunity to gain experience in the new and exciting distributive processing industry.

Our clients have recently launched the first of such systems and the interest shown so far has been exceptional.

The company is a multi-national, successful corporation whose 'state of the art' products have always been innovative and ahead of their time.

The career opportunities for successful applicants are exceptional and progress into a management position will be made available in the medium term to candidates with the necessary qualifications.

Candidates should have experience in at least one of the following disciplines:

1. Sales Support of mini or mainframe computers.
2. Communication expertise.
3. Systems and programming analysis within either hardware or software companies.
4. Commercial Applications experience.

Our client will offer an above average salary plus a good company car and fringe benefits to those applicants who are able to convince us of their drive, enthusiasm and innovative qualities.



Insight Marketing & Personnel
Consultants Ltd.
72-75 Marylebone High Street
London W1M 4AJ
Telephone: 01-486 5644

Please telephone the advising consultant for a confidential discussion.

Ref. No. CW180

SALES MANAGER DESIGNATE Engineering Services

BASE INCOME TO £9,000 per annum — TOTAL INCOME £10,000 per annum plus

COMPANY CAR — EXCELLENT PENSION SCHEME PLUS GOOD FRINGE BENEFITS

Our clients have established themselves at the forefront of the European computer services industry and could be described as the COMPLETE SERVICES AGENCY. Because of an increased demand for their engineering services, they have decided to launch a separate division specialising in technical and engineering applications. This is a genuine and progressive career opportunity which would appeal to those people looking for their first management role or indeed sales managers looking for an increased income and greater responsibilities.

Candidates should be able to demonstrate a successful track record in one or more of the following disciplines:

1. Experience in the sales or support of engineering packages.
2. A civil or electronics engineering background.
3. Sales support in engineering applications with a bureau or software house.
4. Engineers with a determination to break into a sales career.

The reputation of our clients for career development and employee relations is probably the best in the industry and the successful candidate can look forward to a progressive and exciting career.

COMPENSATION PLANS

Sales Manager Designate

Base salary negotiable from £6,000 per annum; a first year guarantee to £9,000 per annum. A commission structure based upon a very realistic quota yielding circa £10,000 per annum.

A company car and all expenses provided.

ACCOUNT MANAGER

Basic salary circa £8,000 per annum. First year guarantee, potential income £9,000. A company car and full expenses are also offered.

For an immediate discussion regarding these exciting positions, please telephone DEAN WILLIAMS quoting Reference Number CW181.



Insight Marketing & Personnel
Consultants Ltd.
72-75 Marylebone High Street
London W1M 4AJ
Telephone: 01-486 5644

data analyst

We are a large, long-established printing company internationally famous for quality colour printing. We also have strong publishing and retail interests.

We are expanding our computer operations to provide improved management information and control initially in areas of production planning, estimating and cost control. Applicants should have experience of programming and systems analysis and be capable of working closely with production and line management, recognising the appropriate basic data, rationalising and interpreting for computer application.

This is a new appointment which carries an attractive salary and assistance with removal expenses.

Please telephone to discuss, or write with full details to: Mr G. Rowe, Personnel Manager, Jarrold Printing, Whitehairs, Norwich NR3 1SH. Tel: 60211.

JARROLD
printing

Senior Systems Analysts/Programmers for Ireland

Opportunities in Dublin and Belfast

NCR offers excellent prospects to experienced Analysts/Programmers with experience of disc-based computers and a sound programming background, for its Systems Services Division in Ireland.

You will implement new installations — NCR Century, NCR Criterion and NCR 8260/8230 systems; work on the updating of existing installations as customers adopt more sophisticated equipment and techniques; carry out surveys of NCR user requirements and assist in presenting systems ideas to customers.

For the DUBLIN vacancies the basic requirements are three years' experience in disc-based systems, B1, B2 and B3 operating systems, and a working knowledge of

of NEAT 3, Level 2. In addition, on-line systems experience would be an advantage.

For BELFAST we need a programmer/analyst with two years' experience of COBOL.

These are definite career development positions for ambitious Analysts/Programmers eager to extend their knowledge in an active environment. The earnings potential is 'first class', plus all the fringe benefits of a major international organisation.

Interested? Then drop me a line and tell me something about your background.

For full details, contact NCR Limited, 208/218 Marylebone Road, London NW1 8LY.

NCR

EDUCATION DEPARTMENT MONKWEARMOUTH COLLEGE OF FURTHER EDUCATION LECTURER—COMPUTING AND DATA PROCESSING

Grade 1 (£2,913-£4,869)
located in the College's Department of Science and Technology.

Applicants should possess at least Part I Membership of the British Computer Society of equivalent qualifications. Previous teaching experience an advantage.

Application forms and further particulars available upon receipt of stamped, addressed envelope from the Principal, Monkwearmouth College of Further Education, Swan Street, Sunderland SR6 1EB.

Closing date for applications: 30th November, 1977.

L. A. BLOOM
Chief Executive

Borough of Sunderland

PROGRAMMERS

WEST COUNTRY
1900 COBOL
£4000

Phone 01-439 6481
(24 hours)
EFFECTIA GRAVIS
Personnel Consultants

COMPUTER
SERVICE
ENGINEERS
Phone 01-439 6481
(24 hours)
EFFECTIA GRAVIS
Personnel Consultants

01-439 6481

